INGENIUM

noun: from Latin, meaning natural talent or disposition

Benedictine College - School of Engineering Newsletter
Vol 7, Issue 1— Summer 2023
Chemical Engineering • Civil Engineering • Electrical Engineering • Mechanical Engineering

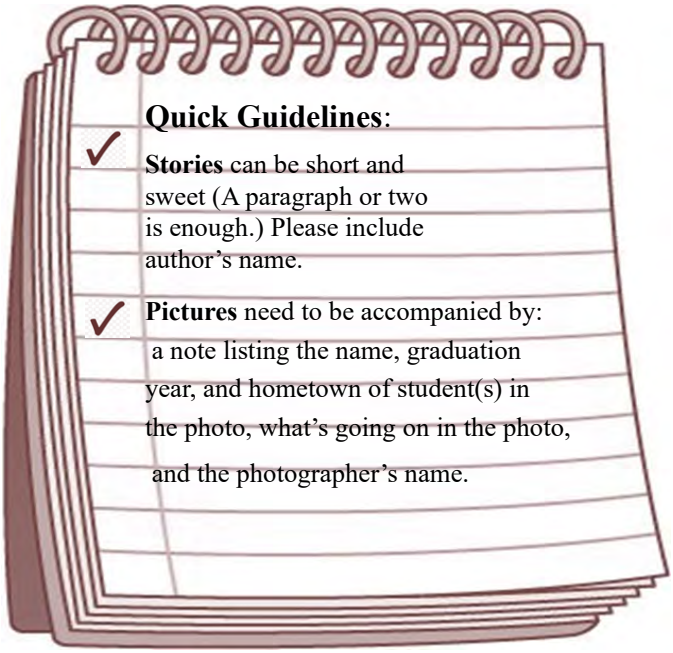
A Look Inside

Alumni, we'd love to hear from you!

Hearing from our engineering alumni simply makes our day. Please consider checking in with us and sharing your success story or important events in your life.

Engineering Students, Have a Great Story? A Fun Picture?

Please submit it for consideration in the next issue!
Send submissions to:
Jann McGregor at
JMcGregor@Benedictine.edu
or John Modlin at
JModlin@Benedictine.edu



Editors: **Faculty:** *John Modlin*
Student: *Steven Graham*

On the Cover:
Front row, left to right: *David Hickin, Matt Cavanaugh, Philip Joseph, Thad Friess, Jared Mewmaw, PE*
Back row, left to right: *Prof. Michael Berry, Scott Mensing, PE, Blaise McCoy, Luke Laskowski*

US Army Corps of Engineers Representatives:
Scott Mensing, PE, Jared Mewmaw, PE

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A Message from the Chair

Dr. Darrin Muggli

Hello again from the School of Engineering. I hope you all enjoyed your summer. This year has been a welcome return to normal after our ABET visit that occurred the previous academic year. We kept ourselves busy, though. Notably, we were saddened to hear that Mike Berry had decided to retire this year after five years at Benedictine College. We will certainly miss him! We will not be short-staffed in civil engineering this fall, however, because our successful faculty search has brought Dr. Patrick Hirl to the faculty. We are very excited that we were able to tempt him away from his successful career in industry. Dr. Hirl is also a deacon, so he has already been helping out at the parish while he and his wife settle into their new home in Atchison.

You may be wondering, "How many Dr. Hirls do you have on the faculty"? Well, the answer is only one because one of them became Dr. Strandquist this summer.

We also updated some of our policies and procedures this past year, which will provide the means for us to help students discover when engineering might not be their calling (and then help them find a major at which they will be successful). These changes should have a significant positive impact on the School.

This summer, we have made a lot of progress cleaning and organizing our space. In particular, the storage room has been transformed, and the mechanical engineers organized the ME Design Lab and got a good start on cleaning out and organizing the pods. Personally, I have done a lot of camping and fishing already this year, which has been great. We also replaced a couple sections of siding and painted the entire house.

As always, we would love to have you stop by the school anytime and visit (or send an email, call, etc.).

Faculty

Professor Berry Retires

Mike was born in Kansas City, Mo., but has been a Kansan ever since. After high school graduation, he attended Kansas State University, where he earned two degrees in civil engineering: A Bachelor of Science in 1980 and a Master of Science in 1981. Mike is currently a professional engineer in the states of Kansas, Missouri, and Nebraska.

While at K-State, he met his future wife, Nancy, and they were married August 2, 1980. They have two children: Grace (Josh) and April (Tom), and six grandchildren: Autumn (12); Annelise (10); Jett (9); Jude (7); Axel (4); and Elijah (3).

Upon graduating from K-State, Mike took a position as a design engineer at Professional Engineering Consultants (PEC) in Wichita, Kansas. Thus began a journey of almost 36 years at PEC, working in five different groups in both Wichita and Topeka. His projects varied in size from large to small, primarily in the areas of grading, drainage, paving, and site development, and he served as manager of various technical groups in the organization. His most notable project role at PEC was Principal-in-Charge for the site development of the $300 million University of Kansas Central District Development. Mike retired from PEC in July 2017.

In August 2017, Mike fulfilled a life-long dream and joined the faculty at Benedictine College. As Assistant Professor of Engineering, Mike taught civil engineering courses in geomatics, hydrology and hydraulics, soil mechanics, transportation, contracts and specifications, and the senior design capstone course. His favorite course to teach was the senior design course, where he had the opportunity to utilize his rich variety of experience to demonstrate to students how to synthesize all they have learned to solve a problem.

In retirement, Mike is looking forward to spending more time with his grandchildren, and daily bicycling with his wife, Nancy, among other activities.

Faculty

By Dr. Scott Newbolds

Professor Michael W. Berry was presented with a Lifetime Achievement Award from the Kansas Section of the American Society of Civil Engineers (ASCE). The award acknowledged his lifelong civil engineering career and contributions to the profession in the state of Kansas.

After receiving his master's degree in 1981, Michael's professional career spanned 36 years before retiring and taking a full-time academic position at Benedictine. Prof. Berry spent his entire professional career with Professional Engineering Consultants (PEC). Beginning in Wichita, he worked in PEC's Land Development and Transportation Divisions eventually becoming the Land Development Division Manager. Subsequently he moved to the Topeka Department and became Department Manager, overseeing all civil engineering projects in the Topeka and Lawrence offices. Berry worked on numerous projects over his career including street and highway improvements, drainage and stormwater management, and zoning.

Perhaps his most significant contribution, though, is his dedication to developing the next generation of engineers. Throughout his time at PEC, he mentored dozens of young engineers, helping them to develop their own careers. Additionally, he continued to support the education and professional development of the next generation of engineers as a professor at Benedictine College. Prof. Berry stepped down from his faculty position at Benedictine at the end of the Spring 2023 semester. This award is a fitting tribute to a man whose entire career was dedicated to serving the people of the State of Kansas.

Professor Berry accepting the award from Thaddeus Friess and Blaise McCoy

Dr. Hirl Joins Faculty

Dr. Patrick Hirl joins the School of Engineering faculty this fall, teaching Civil Engineering. Prior to coming to Benedictine, Dr. Hirl taught at the University of Illinois at Chicago, the University of Minnesota, and the University of St. Thomas. For the last 24 years, he has been a consulting engineer working on projects in groundwater remediation, soil remediation, industrial wastewater treatment, municipal wastewater treatment, and renewable energy.

In the last five years, he has designed, built and started up four waste to renewable energy facilities. Dr. Hirl is also a permanent deacon in the Catholic Church. He is looking forward to helping students benefit from his many years of consulting experience and to sharing his diaconal ministry. Dr. Hirl also served as a submarine officer in the US Navy.

Dr. Hirl and his wife, Denise have been married for 35 years and have four grown children. Denise is an avid knitter, cook and gardener as well as a high school math/science teacher. One of their children is Dr. Katharine Strandquist, a 2018 Benedictine Graduate and a member of the School of Engineering faculty. Dr. Hirl is very excited to work with his daughter at Benedictine. Outside of office and ministerial duties as a deacon, Dr. Hirl enjoys brewing his own beer recipes and spending time outdoors hiking, biking, canoeing, hunting, fishing, and camping. Dr. Hirl and Denise moved to Atchison from Minneapolis, Minnesota where they have lived for the last 24 years. Dr. Hirl wants everyone to know that his door is always open for discussions on engineering or other questions about life. The Hirls are looking forward to having students over to their house for dinner in order to teach and learn outside of just academics.

Engineering Mission 2023

Clean Water for the Dominican Republic

By David Hickin and Blaise McCoy

Led by senior engineering students, David Hickin and Blaise McCoy, a team of 14 students traveled to La Luisa, Dominican Republic to construct a water distribution system. It included two miles of piping and trenching as well as building a water storage tank. As missionaries, we were able to live and work alongside the community and complete the task together. Although there was a language barrier, we found that we could communicate simply through work and laughter, all working toward the common goal of providing clean water to their village for generations to come.

The water source is a mountain stream located around two miles away from the village and is very difficult to access. Our team installed a gravity-driven pipeline using no power tools or pumps. The system is relatively simple and easy to operate, allowing the community to take ownership of the project.

This project impacted over 100 families that had unreliable and contaminated water sources. It will allow the women and children who would ordinarily be tasked with collecting water to have more time to work and attend school.

Engineering Career Exposition

By Jennifer Dittemore, Career Services

The Benedictine College School of Engineering and Office of Career Services proudly collaborated to host the second annual fall and spring engineering expos in October and March. The McAllister Board Room provided the setting as recruiters from 23 companies met with nearly 100 students at each event.

The expos facilitated introductions and conversations between students and employers to learn about each other and provide opportunities for internships as well as full-time positions. With two successful years of in-person events, the third fall expo was held for Friday, September 15th. Students may wonder if the expos are for upperclassmen only. Absolutely not!

The expo is for freshmen through seniors. Networking has been said to be the number one job search strategy. Who you know matters! This must begin early in the college years to give students time to adequately get their name out there and build social capital. Both companies and potential employees need to determine good fits. In addition, it's crucial to practice communicating in person with potential employers before landing the big interview.

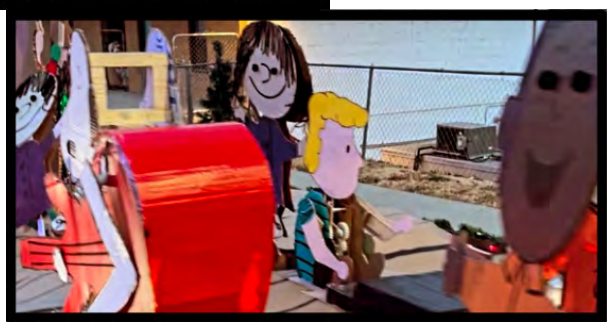
Those participating included: Altec Industries, American Direct Procurement, BlueScope Buildings North America, Custom Truck-One Source, Frito-Lay, GBA Companies, Hartfiel Automation, HDR Engineering, Heatron, Herzog Engineering, KASA Controls & Automation, Kaw Valley Engineering, Kansas Department of Transportation, United States Marine Corps-School of Engineering and Marine Officers, MGP Ingredients, Missouri Department of Transportation, Northrop Grumman, NorthWind Technical Services, Professional Engineering Consultants, P.A., Schenck Process, Snyder & Associates, US Air Force Reserve, US Army Corps of Engineers, US Navy, Elemental Scientific, Triumph Foods, Vector Structural Design, PC, and Preston Refrigeration.

Class Projects

Design of Machinery-Christmas Parade Float

Atchison Christmas Parade
Fall Semester Project
Article by Steven Graham, Pictures by Grace Brandl

Professor Modlin's Design of Machinery Class included a semester long project to incorporate principles learned in the class into a display to be shared with the whole town of Atchison in the annual Sights and Sounds of Christmas Parade. Early on, the mechanical engineering students each suggested themes and the class chose the cross-generational classic, "A Charlie Brown Christmas." Guided by Mr. Sean Bauer, Benedictine's shop manager, the nine groups were able to design and fabricate their designs. Students from Benedictine's Art and Design Department provided the artwork, making the *Peanuts* characters unmistakable! The class earned 2nd place out of well over 40 participants, by bringing some of the most nostalgic scenes to life.



Class Projects

Ergonomic Design

By Jubilee Horton

An ergonomics elective class was offered by Professor Smith in the 2022 spring semester. The class taught students about designing tools that minimize injuries for users. It also encouraged them to create designs that serve as many users as possible, rather than a certain group of users. For their final class project, each team was tasked with finding a tool with a poor design and re-designing its handle to minimize injuries and accommodate users with different hand sizes.

The teams chose a lighter, a drill, a file, and a brush. Students used Play-Doh to model the re-designed handles and everyone in the team submitted their hand measurements to represent a sample of the entire population. From the Play-Doh models, the handles were designed using CAD and then they were printed using the Benedictine College 3D printers.

One of the teams designed an ergonomic handle that was 3D printed and added to a lighter. Prof. tenBroek of the math department requested students do this since the lighter's original design made it difficult for most people to use it at St. Benedict's Parish.

This new handle is still in use at St. Benedict's and allows for more people to easily and safely use the lighter.

As pictured, top left to bottom right: Matthew Cavanaugh, Samuel Anderson, Jubilee Horton, Natalee Brake, Patrick Lange, John Paul Keenan, Mary Zappe, Wade Hoffman, Frank Griesbauer, Nicholas Hemman,George Essler, Cole Biermann, Sam McElroy, and Ben Schwartz

Class Projects

Civil Engineering Hydroponics

By Dr. Peter Merkle

Students in the Intro to Civil Engineering Lab grew hydroponic lettuce, micro greens, and a sunflower. This was to assess the potential for water quality improvement in local detention lakes using floating rafts of food crops.

CIVL-3020 Water Treatment

By Dr. Peter Merkle

Students in Environmental Engineering and Hydraulics Laboratory were challenged to design and build a solar-powered drinking water treatment system for use in an emergency. The associated laboratory experiments required several weeks of focused work to determine a treatment approach and evaluate alternative designs. This effort included determination of the suspended solids concentration, the optimal dose of coagulant and pH conditions suitable for Missouri river water, the source of Atchison's drinking water. A sand and activated carbon filter was designed and tested, based upon research literature review. An ultraviolet (UV) in-line disinfection device was chosen to support the final disinfection step with household bleach. The hydraulic design identified the pumps, piping, valves, and flow rates required for safe operation. Once the solar panels arrived, the students conducted all laboratory work over several weeks exclusively with solar battery power. With great attention to detail in laboratory methods, the students obtained precise and reproducible data on water quality conditions. The raw river water had a turbidity over 25 nephelometric turbidity units (NTU), while post-coagulation settled water was reduced to 2.5 NTU, reduced further to 0.15 NTU by filtration in the final test. Designed to last, the system will provide future students with a robust experimental platform to explore a variety of topics in fluid mechanics, hydraulics, and environmental engineering.

Class Projects

Civil Engineering Argentine Pump Station Field Trip

By Prof. Mike Berry

Thanks to an invitation from Mr. Scott Mensing, P.E., U.S. Army Corps of Engineers, students in Dr. Merkle's Environmental and Hydraulic Engineering Lab course made a field trip to the Argentine Main Pump Station in Kansas City, Kansas. This pump station, with a pumping capacity of 150,000 gal/min, is just one component of the $529 million Kansas City Levees project that aims to improve the reliability and resiliency of three existing levees along the Kansas River in the Kansas City metro area. It is expected to reduce flood risk by 200% for about 30,000 people that live and work behind the levees.

Students learned about many aspects of the 17-mile long project: subsurface investigations and interpolations, soil and pile founded floodwalls, heavy earthwork operations (~1.5 million cubic yards), under-seepage and slope stability requirements, relief wells, deep foundations, hydrologic and hydraulic modeling, levee safety, risk-informed decision making, just to name a few.

Junior Design

Curb Climbing Wheelchair

Isabelle Honigfort, Sally Napierkowski, and Olivia Hill

This project utilizes a four-bar mechanism to assist wheelchair users to move up curbs without help. The user must be able to get the front wheels over the curb to implement the use of the mechanism by pulling a lever.

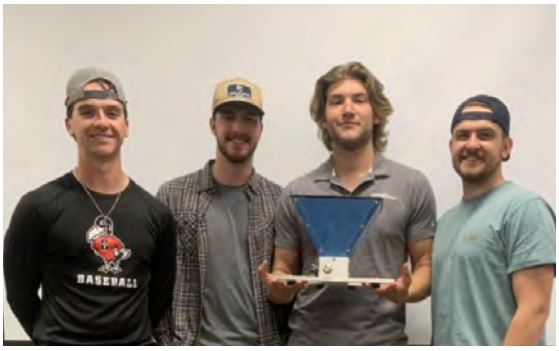
Model Coal-Fired Steam Train

Patrick Moraghan, Matthew Gardner, Taylor Goring, and Zachary Schwinn

This model steam train utilizes a coal furnace and boiler to create steam to power a single-acting oscillating piston, which drives the train. The train is a model G-scale size and can be used on G-scale tracks.

Grain Mill Modification for Br. Maximilian

Davis Wagner, JP Buss, Will Thomas, and Hunter Moffet



This Grain Mill Modification project for Brother Maximillian at St. Benedict's Abbey adds features to a standard grain mill. This mill now operates hands-free, grist buckets are easily changed, and dust is contained.

Wet Cat Food Dispenser

Gregory Bourget, Shane Koehr, Luke Marquis

This prototype automatic cat feeder dispenses wet (canned) food on a preprogrammed schedule from a refrigerated chamber.

Junior Design

Full-Whiteboard Eraser

Roman Becher, John Halberg, Joel Iwanski

This project is a wall-mounted eraser which sweeps back and forth across the entire white board for rapid erasing. The eraser can also be retracted from the white board to skip sections without erasing.

Portable Baseball Plyo-board

Carson Kasl, Doug Vestrat, Jackson Sarver

Easy access to proper warm up and cool down techniques are of extreme importance to a baseball player's performance. A portable plyo-care board can be easily taken on the road to be thrown against anywhere.

Racing Chair Redesign

Peter Keegan, Calvin Benson, Nicolas Pena

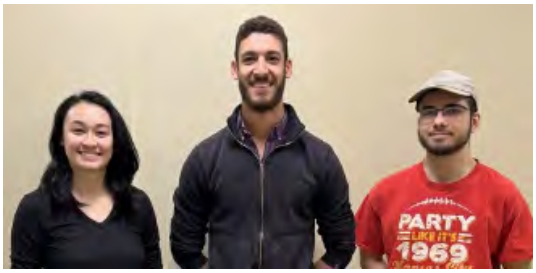
The objective of this project is to redesign a racing wheel chair for a disabled rider. This design is aimed at making the chair easier to enter and exit than the family's current, model while also making it more comfortable for the rider, during long road races.

Generate Power from Exercise Equipment

Michael Price, Kolbe Dax, Steven Graham

The goal of this project is to make a human powered gravity battery that charges a mobile phone by converting the kinetic energy of a falling weight, lifted by a single adult, into electrical energy.

Junior Design



Catapult Classroom Training Aid

Jacob Schmidt, Hannah Schwarz, Nicholas Bendele

This is a desktop torsion catapult designed to demonstrate physics concepts of projectile motion, torque and moment, work, energy, and power.

Casting Sand Processor

Sam Anderson, Francis Greisbauer, Max Palmer, Jacob Clipperton

This team designed a two-stage crushing machine to more efficiently recycle used green sand from the casting process.

A Life Changing Project

The School of Engineering recently received the following note from Dr. Andrew Doyle, who works with disabled students in the Leavenworth School District. One of the 2022-23 Mechanical Engineering senior design teams designed and built a power wheelchair trainer for the District (see next page).

"The power wheelchair trainer the engineering team built last year has already delivered life-changing results! I have been using it with a student who has very limited mobility and it has enabled us to try different set ups until we found a way that he could be successful. I was then able to communicate this set up to an assistive technology professional who was able to bring a trial powerchair this past Monday. The trial was a huge success and this student is now on track to get a powerchair of his own!

I cannot tell you how big of a deal it is for a child to go from being pushed around everywhere by an adult to being able to drive on his own, but I think the phrase life changing best describes it. I don't believe this ever would have happened had it not been for the great job the engineering students did last year on the power wheelchair trainer, so I wanted to give you guys a big thank you for one life changed, and hopefully more to come...

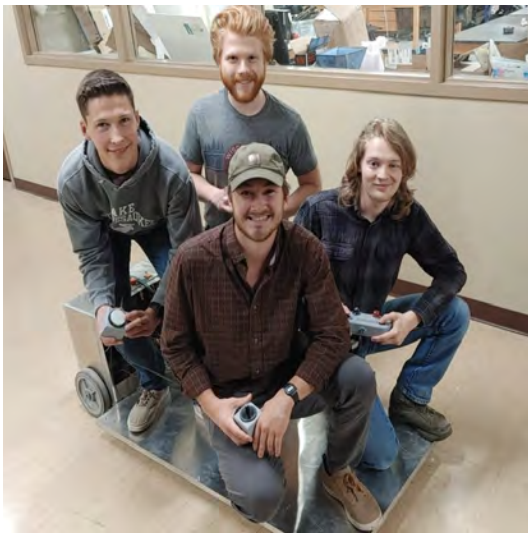
Thanks again,
Andrew Doyle, DPT"

Capstone Projects (ME)

Power Wheelchair Trainer

Client: Leavenworth School District, Leavenworth, KS

Gabe Virnig, Sam Barnes, Marco Kouatly, Peter Malone



Wheelchair trainers assist handicapped and cognitively impaired individuals in learning to operate a powered wheelchair. However, trainers that augment an existing standard wheelchair with training capabilities are not currently commercially available. A device capable of augmenting any standard wheelchair into a power wheelchair trainer would be invaluable in training cognitively impaired students to drive a powered wheelchair, opening new avenues of freedom in their lives.

Pin Installation Tool

Client: ALTEC Industries, St. Joseph, MO

Cole Biermann, Natalee Brake, Wade Hoffman, Silas Whitehead

ALTEC Industries uses pivot pins to provide a point of rotation for their utility vehicles. Currently the pivot pins are installed using dead blow hammers, which is slow and tedious and has caused shoulder and back injuries. The Pin Pushers Senior Design Team designed and manufactured the Pivot Pin Installation Tool to replace the current installation process. It consists of a hydraulic press that attaches to the booms via an extendable arm and is remotely operated.

Lift Station Solids Removal

Client: MGP Ingredients, Inc., Atchison, KS

Isabel Cobb, John Paul Keenan, Nicholas Ingolia

MGP uses basket strainers to remove debris from the wastewater pumped from a sewage lift station to its treatment facility. The strainers require weekly cleaning. MGP desires a filtering system that does not require frequent cleaning. Our design solution contains a hopper that collects the debris and the water as it enters the lift station and directs it to a 15-foot filtering conveyor. The conveyor scoops debris from the collection hopper and runs it up and out to an awaiting waste bin outside the basin.

Capstone Projects (ME)

Lower Leg Prosthesis

Client: Global Reach Bionics, Fayetteville, AR

Jubilee Horton, Anthony Rumpza, Ben Schwartz

The team designed a custom prosthetic leg for a patient in Arkansas who recently had a below-knee amputation. This prosthetic leg features a socket and foot 3D printed from PETG, an aluminum pylon (the piece between the socket and foot) and medical-grade connection pieces.

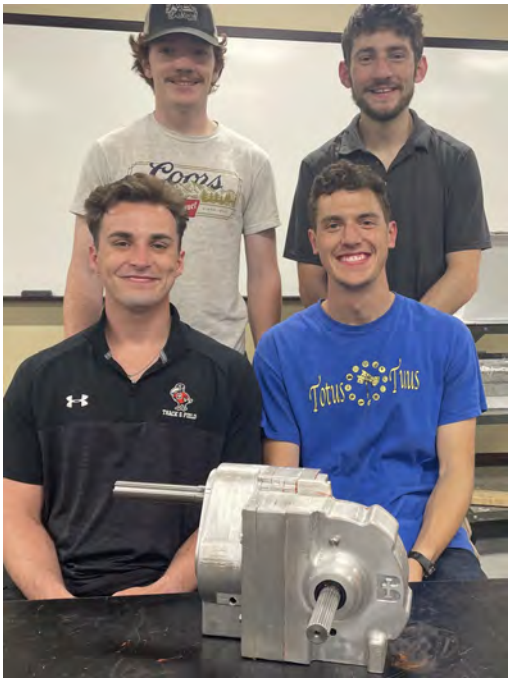
Ground Grain Sampler

Client: MGP Ingredients, Inc, Atchison KS

Gabriel Ambuul, John Paul Alicea, Mary Zappe, Nicholas Hemman

The purpose of this project is to provide a risk mitigation mechanism to help reduce the effects a torn hammer mill screen may have on the process at MGP Ingredients Inc. The grain sampler is a bypass system that can be added to the main grain line to extract whole kernels of corn. The kernels in the sampler indicate there is damage to the hammer mill screen.

Baja Drive Train



Client: Benedictine College School of Engineering

Joseph Crouch, Mike Kelly, Matt Maguire, Joseph Rawicki

The goal of the project was to design, procure, manufacture, and integrate drive train components into the existing Baja buggy frame and suspension systems to produce a high-performance four-wheel drive vehicle. The new drivetrain features a 10 HP engine, a continuously variable transmission, a custom aluminum enclosed gearbox, a lightweight aluminum driveshaft, universal joints, and differentials. The drivetrain will be used by future teams as the vehicle evolves to compete in a future SAE Baja competition.

Capstone Projects (CE & EE)

Argentine Pumping Station

Client: Kansas City District, US Army Corp of Engineers

The project consists of a pump station along the Kansas River levee to serve the community of Argentine in Kansas City, KS. The station will protect the community from flooding when the river is in a high-water stage, by pumping interior stormwater over the levee to discharge into the river. The students have included three vertical turbine pumps in their design to account for peak flows of 77,000 GPM. The project client provided survey and geotechnical information for use by the design team. The scope of the project encompasses site grading and design, pump design, wet well design, utility coordination, slope stability of excavations, and ease of construction. The project team is developing construction drawings utilizing AutoCAD software, as well as technical specifications and a formal design narrative report, to the 65 percent completion stage.

Group pictured on front cover

Autonomous Robot and Drone Navigation

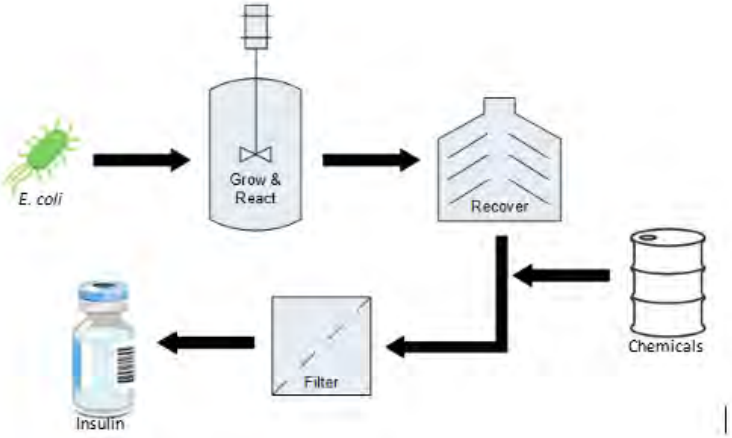
Left to Right: Ambrose Shaughnessy, Patrick Curran, Emily Rockers

The 2023 Institute of Electrical and Electronics Engineers (IEEE) Region 5 robotics competition is focused on cooperative behavior between a drone and a ground robot system to efficiently navigate between specified locations. This project requires the system to autonomously navigate through a series of boxes with the order of entry determined by QR codes located on top of and inside of each box. The drone starts the process by completing an aerial scan of the course and identifying both the QR codes on top of the boxes and the relative position of each box. The drone will then direct the ground robot to the first box in the series. The ground robot determines the next box in the entry sequence by reading the QR codes inside of the boxes. In addition to the design of the ground robot, subsystems such as precision drone landing, boundary detection, motor control, image processing, and sensor networks were developed for this project.

Capstone Projects (ChE)

Industrial Scale Production of Human Insulin

Patrick Lange, Grace Nelson, Rebekah Nelson



Insulin is a pharmaceutical product that many people need to survive. Three large companies are the primary producers of the world's insulin supply, allowing them to monopolize the price of insulin. Without a competitive generic market, the price of insulin is unaffordable for most people, especially those in mid-low income countries.

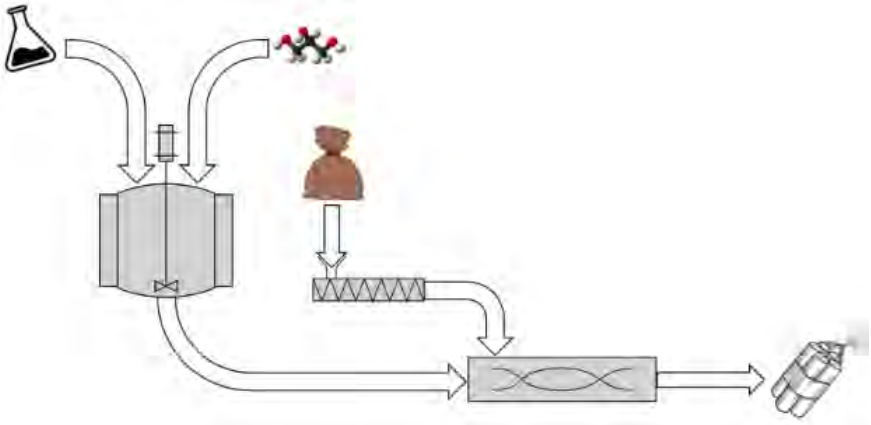
This project designed an industrial scale human insulin production facility that produces a generic human insulin product to be sold at 45% of the current market value. The designed process combines and upscales lab processes that include direct refolding and enzymatic reaction of human preproinsulin to produce 20 million vials per year of human insulin from E. coli. The process has a positive NVP and requires about $27 million in capital investment.

Desensitized Gelatin Dynamite Production

Andrew Baier, Anthony Bridges, Matus Koska, Shannon Rajkowski

With the push for more renewable energy, mining production has increased and with it the demand for dynamite. The manufacturing of dynamite contains inherent safety concerns both during processing and handling. Many forms of desensitization significantly decrease the detonation performance of the dynamite, rendering it less valuable.

This project designed a process to produce desensitized gelatin dynamite from glycerol and mixed acid without lowering the detonation performance. The process is economically feasible with a capital investment of ~$12 MM and includes extreme safety precautions.



Organizations

Sleep in Heavenly Peace (SHP)

By Mary Zappe

The 2022 Benedictine College Chapter of Sleep in Heavenly Peace (SHP) had a very successful fall semester. The chapter built 67 beds and delivered 66 of them to children in need. All of which would not have been possible without our amazing volunteers, many of whom are engineering students!

For those who may not be familiar, SHP is a volunteer organization that consists of different chapters spread all over the US. The chapter at Benedictine College primarily serves the towns of Atchison, St. Joseph, MO, and Leavenworth, KS. Volunteer Opportunities include delivering beds, helping on build days, and making phone calls to schedule deliveries. If you've helped in the past, or are new to SHP, please consider coming to a build day or going on a bed delivery this semester! It is definitely a great way to give back and to help our Atchison community.

More Info and Sign Ups

Society of Women Engineers (SWE)

By Grace Nelson

Benedictine College's Society of Women in Engineering (SWE) Chapter was founded in Spring 2021 with the goal of supporting women in the Benedictine School of Engineering. Since its founding, BC's SWE chapter has offered several career development opportunities, including department-wide resume building workshops and a student-led Q&A panel on internships. SWE also hosted professor presentation nights (where professors present on random, fun topics with no prep!) and community brunches with the women engineering faculty. It's a great way to get to know the other women in engineering!

ASCE Student Chapter Hosts Banquet

By Dr. Scott Newbolds

The Benedictine student chapter of the American Society of Civil Engineers (ASCE) hosted the student chapters from Kansas State University and the University of Kansas for a joint banquet. The annual event, sponsored by the Kansas Section of ASCE, provides the opportunity for students from the three civil engineering programs in Kansas to get together with the professionals from the Kansas Section. Around 60 students and faculty members attended the event which included a presentation on the Kansas Levee Project by engineers from the U.S. Army Corps of Engineers.

Congratulations!

May 2023

Nicholas Ingolia
Peter Malone
Jubilee Horton
Mary Zappe
Marco Kouatly
Matthew Maguire
Wade Hoffman
John Paul Alicea
Benjamin Schwartz
Emily Rockers
Shannon Rajkowski
Anthony Bridges
Paige Schmid
Patrick Lange
Rebekah Nelson
Catherine Marak
David Hickin
Jenson McDermott
Blaise McCoy

August 2023

Frank Feuerborn
Cole Biermann
Ambrose Shaughnessy

December 2023

Sam Barnes
Isabel Cobb
Natalee Brake
Gabriel Virnig
Gabriel Ambuul
Joseph Crouch
Nickolas Hemman
Joseph Rawicki
Michael Kelly
John Paul Keenan
Grace Nelson
Matus Koska
Luke Laskowski
Thaddeus Friess
Patrick Curran

2023 Graduates

Electrical

Emily Rockers

Ambrose Shaughnessy

Patrick Curran

Chemical

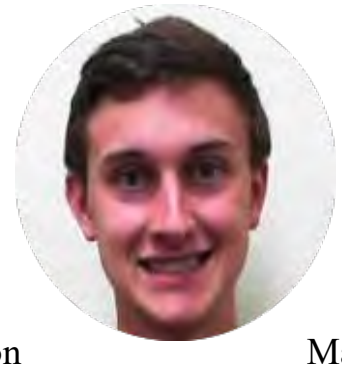
Catherine Marak

Shannon Rajkowski

Anthony Bridges

Paige Schmid

Patrick Lange



Rebekah Nelson

Grace Nelson

Matus Koska

2023 Graduates

Civil

Blaise McCoy

David Hickin

Jenson McDermott

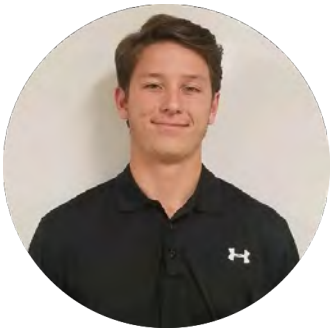
Luke Laskowski

Thaddeus Friess

2023 Graduates

Mechanical

Nicholas Ingolia



Peter Malone

Jubilee Horton

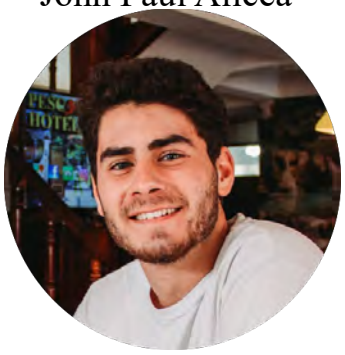
Mary Zappe

Marco Kouatly

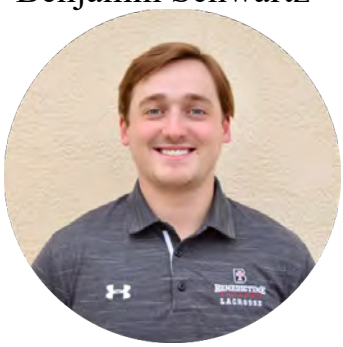
Matthew Maguire

Wade Hoffman

John Paul Alicea



Benjamin Schwartz



Frank Feuerborn

Cole Biermann

Sam Barnes

2023 Graduates

Mechanical

Isabel Cobb

Natalee Brake

Gabriel Virnig

Gabriel Ambuul

Joseph Crouch

Nicholas Hemman

Joseph Rawicki

Michael Kelly

John Paul Keenan

2023 Student Awards

St. Patrick Award

The Outstanding Engineering Student

Ambrose Shaughnessy

St. Joseph Award

The Outstanding Student Worker

Michael Kelly
Mary Zappe

The Outstanding Engineering Student Athlete

Thaddeus Friess

The Top Engineering Student

Civil:	**Thaddeus Friess**
Chemical:	**Rebekah Nelson**
Electrical:	**Ambrose Shaughnessy**
Mechanical:	**Marco Kouatly**

Mechanical Engineering Senior Design Award

Marco Kouatly **Peter Malone** **Sam Barnes**
Gabriel Virnig **Joseph Crouch** **Michael Kelly**
Joseph Rawicki **Matthew Maguire**

Electrical Engineering Senior Design Award

Ambrose Shaughnessy

Emily Rockers

Patrick Curran

Alumni Highlights

2019 - Chemical Engineering

Tyler Gochenaur is working as a Quality Engineer for Northrop Grumman Corporation in Utah. Tyler credits his Benedictine College experience with giving him tools to critically think and analyze problems. His favorite course was Plant Design, as it provided an opportunity to use concepts from previous courses and put them together with an overall economic analysis.

2020 - Civil Engineering

Paul Johnson does structural building design at Hollis & Miller Architects in Kansas City and recently passed the PE exam in the civil-structural discipline. He married his college sweetheart, Tessa Jimenez ’20, a week after graduation. They are expecting their first child. Structural mechanics and reinforced concrete and steel design most-prepared him for his engineering work. He credits senior design with providing experience with a longer project, but regrets that it was cut short by COVID.

2020 - Mechanical Engineering

Hannah Thomazin is a Project Controls Engineer at U.S. Engineering in Kansas City, where she worked as an intern, prior to graduation. She has worked with a variety of project teams on project data analytics, focused on the question “how can we be better than we were yesterday?” Her experience as a student-athlete at Benedictine College taught her to work within complicated team dynamics and to set and communicate challenging goals. “Learning liberal arts and taking fundamental engineering classes has set me up for success in my short career so far, and I am able to [solve problems] in more creative ways than my peers.”

Alumni Highlights

2021 - Civil Engineering

Cole Lehman works as a Civil Engineer with MKEC Engineers in Overland Park, KS. Cole appreciates learning from his Benedictine College professors' experience, which went beyond the textbooks, especially the project management aspects of real-world projects. He will be taking time away from his job to be a missionary to Ireland with NET Ministries during the coming school year. He plans to return to the KC area when he returns next summer.

2021 - Mechanical Engineering

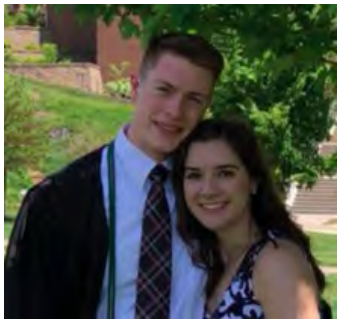
Grace Rembold is working in New York as a Manufacturing Engineer with QuidelOrtho. Grace credits her Benedictine College engineering preparation with teaching her teamwork, initiative, time management, and critical thinking. Her second major in philosophy helped here stand out among other job applicants. She is involved in a Catholic young adult group, Titus Fellowship and the connected outreach center, St. Irenaeus Ministries.

2022 - Mechanical Engineering

Sam Fabozzi is working as a Manufacturing Engineer at Doosan Bobcat, where he is currently working on a project to develop a new plant layout and procure laser cutting equipment. Sam credits his leadership experience with Sleep in Heavenly Peace with helping him work with large groups of individuals.

Alumni Highlights

2023 - Chemical Engineering



Anthony Bridges is working as a Supply Chain Engineer for DAK Americas in Charlotte, NC. He is married to Katera Moberg-Bridges '21.

2023 -Mechanical Engineering

Wade Hoffman is working as a Design/Manufacturing Engineer at Farrar Corporation in Norwich, Kansas, where he is leading a project to implement a robotic system in a foundry's cleaning room. He is engaged to be married to Anna Ziebol this fall.

Matt Maguire is working as a Mechanical/Fire Protection Engineer at Geary Engineering in Lincoln, Nebraska. Matt's favorite engineering class was our new Mechatronics course.

Alumni Check-in

We want you in the next issue of *Ingenium!*

New Technology

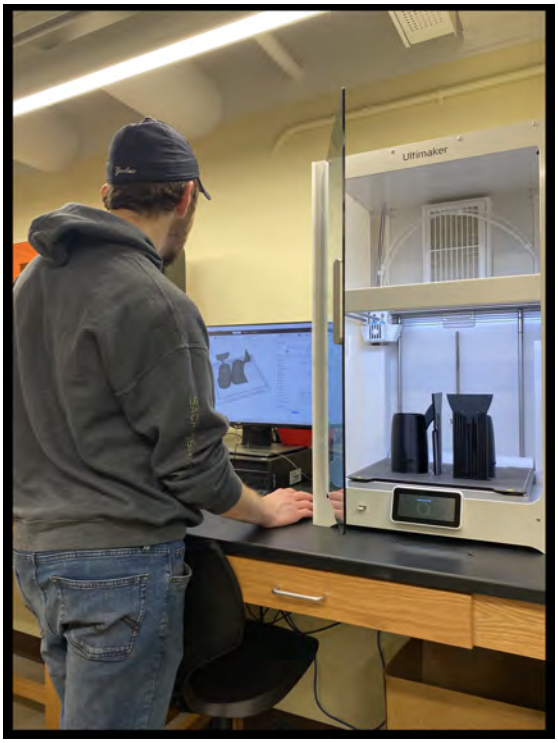
Additive Manufacturing

New Ultimaker S7 – Professional 3D Printer

By Dr. Charles Sprouse III

After almost a decade of service, the School of Engineering's LulzBot Taz 5 printer was retired in favor of a brand new Ultimaker S7. This upgrade in large format (around 12"x12" footprint) Fused Deposition Modeling (FDM) printer provides a new, reliable, high quality workhorse for the 3D print room, helping students fabricate their designs throughout their academic careers, from Technical Drawing all the way through Senior Design! (And many other times in-between, including Manufacturing Processes Lab, Design of Machinery, Junior Design, Ergonomics, Mechatronics, and many more.)

The Ultimaker S7 features a dual extruder head, for multi-color and multi-material prints, and has the potential for future expansion into metal 3D printing. The machine is also very safe, with prints occurring inside an enclosure that has a built-in air management system and camera.



New Technology

CNC Upgrade for Old Lathe

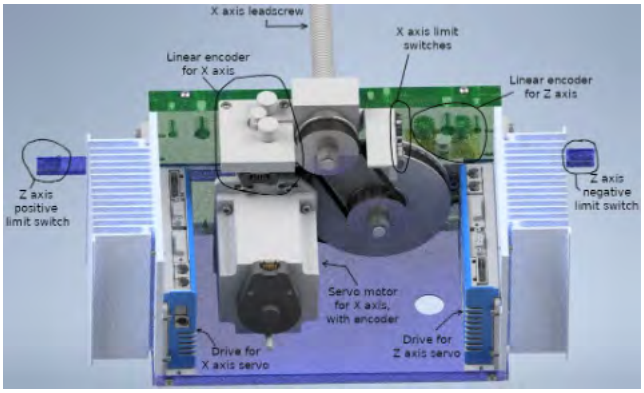
By Sean Bauer,
Benedictine School of Engineering shop and lab manager.

It began with a need for a high-quality finish on torsion samples for the materials lab. These samples have been made in our shop since the early days of the engineering program, using a manual lathe with a rounded cutter to produce the required radius on the samples. Unfortunately, this cutter produced poor results, especially when stainless steel samples were needed. We needed a CNC (computer controlled) lathe, so that a standard 60-degree triangular tipped cutter could be used. Purchase of a commercial CNC was a long way off and an immediate solution was needed. Shop Manager Sean Bauer determined that conversion of one of the manual lathes was feasible. The large South Bend lathe was chosen for the upgrade.

The Engineering department inherited the lathe from the Physics department. It shipped from the manufacturer in 1946 and may have stood in the Abbey shop at one time.

Using his own computer code, Sean started by controlling the cross-feed axis with promising results. Soon both axes were under computer control and high-quality torsion samples were in production! Since then, the lathe has been updated to accommodate Autodesk's Fusion 360 computer aided manufacturing (CAM) software used by students in Manufacturing Processes and senior design courses. An electronic drive was also added for the spindle, making it possible to do CNC threading on the lathe.

While there are still potential improvements, the project is essentially complete and has already been used for student projects and making various items for the shop. The converted South Bend CNC lathe should play an important role in the Engineering Shop for many years!



INGENIUM

Benedictine College - School of Engineering Newsletter

Ingenium signifies intelligence, character, genius — all of which describe Benedictine College engineers. The use of the Latin language shows solidarity with the Church, whose official language is Latin, and with the scientific community, which for many years communicated primarily through Latin. *Ingenium* is a proud testament to our history and character as engineers and as members of the Benedictine College community.

Benedictine College School of Engineering
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www.benedictine.edu/engineering