

SEMESTER NEWSLETTER

Message From the Chair



As an educator, I gain great satisfaction seeing students graduate and begin the next step of their lives with bright futures ahead. The overwhelming majority of University of Idaho College of Engineering students graduate with a

good-paying job, admission into an excellent graduate school program, or entrepreneurial missions on the horizon. Our graduates know their trades. That's validated by the awards they win.

Chemical and Biological Engineering (ChBE) students dominated the College of Engineering Award Ceremony this year. ChBE students also rocked both internal and external student competitions. A team of chemical engineering students went to New Mexico State University to compete in the WERC Environmental Design Contest with participants from 11 universities from Ohio to Mississippi, and California to Washington. They competed in Task 3: Sodium Sulfate for a Circular Economy—Community-based Solutions, winning first place in the bench scale demonstration, first place for the Task 3 competition overall, and the Freeport-McMoRan Innovation in Sustainability Award. What an outstanding performance!

Both of our Grand Challenge Scholar graduates from the college were ChBE students. Our Engineering Ambassadors program, which works with visiting prospective students and their families to help groups learn more about life at U of I, six of 10 ambassador winners were from our department.

Our faculty were also recognized for their outstanding work. Dr. Nathan Schiele was awarded the College of Engineering Outstanding Teaching Award and Dr. Vivek Utgikar received the Outstanding Faculty Award.

I am also delighted to report that Dr. Steven Gardner has accepted the Lou Edwards Endowed Chair in Chemical Engineering. A principal chemical engineer in industry for more than 20 years, Gardner is recognized for his expertise in developing and synthesizing new materials for catalytic chemical conversion, membrane separation and structural composites. Gardner comes to the U of I from Pall Corporation's Membrane Technology Center, a global supplier of filtration, separations and purification products, where he serves as senior principal research and development engineer.

FAFSA had technical issues and delayed scholarship awarding this year. The departmental scholarships that we usually award in early March were not awarded until late April. Nevertheless, we were able to award 13 chemical engineering students and 35 biological engineering students with a total \$137,500. The scholarships help students with financial need and provide incentive for achieve academic excellence.

Our Biomedical Engineering Certificate was approved by the university curriculum committee. Starting fall 2024, students who take an approved list of 12 credits can receive this certificate. This will allow students to better differentiate themselves in the job market with a biomedical engineering emphasis.

We are considering other certificates to help students specialize in other skill areas related to chemical engineering and biological engineering. You can email your thoughts to chbe@uidaho.edu or through a [web form](#).

Thank you.

Dev Shrestha, Ph. D.

Department Chair.




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Degrees Awarded

Spring semester is when most students graduate. Many have already accepted positions in industries like semiconductor, paper, environment engineering firms, pharmaceuticals, or are heading to graduate school like Ph.D. in Biomedical Engineering at Cornell and Tulane.

Undergraduate Degrees

Biological Engineering	Chemical Engineering
Abby Fellows	Aaron Goeckner
Ben Morenas	Ashley Keeley
Hailey Faith	Chelsea Barrera
Ishmael Staples	Destinee Ditton
Jaycee Johnson	Donald Macdonald
Nathan LaVoie	Grace James
Peter Wieber	Kaylee Janett
Sydney Schoth	Kendall Reeder
	Kristian Jacobson
	Luke Zrodlo
	Nick Knowles
	Paetra Morgan
	Travis Kerr

Graduate Degrees Awarded

Student	Degree	Major	Major Professor
Chaithanya Balumuru	Ph.D.	ChE	Vivek Utgikar
David Reetz	M.E.	BE	Jagdish Patel
Goutham Burla	Ph.D.	BE	Dev Shrestha
Konstantine Geranios	M.S.	ChE	Matthew Bernards
Steven Rougeux	M.E.	BE	Ching-An Peng
Sydney Inman	M.E.	BE	Deborah Stenkamp
Taylor Booker	M.E.	BE	Sarah Wu

 *Congratulations Graduates!*

Student Awards

The WERC Environmental Design Contest was established in 1991 as one facet of the "Waste-management Research Consortium" (WERC). Universities from across the country compete to design engineering systems that address the Water, Energy, and Climate Nexus. UofI team was competing in Task 3. UI received awards for 1st place for best bench scale in the task 3, 1st place Overall in task 3 (meaning our team won task 3), 2nd place for their poster (for all tasks and all

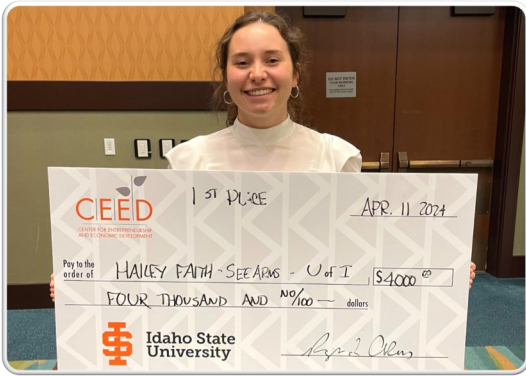
schools), and the Freeport McMoRan Innovation for Sustainability award (for all tasks and all schools), which represents the overall winner for the competition with a traveling trophy they will ship after getting it engraved. In order of awards presented, the team won \$1000, \$2500, \$500, and \$2500, for each award, respectively.



WERC team from left: Nick Knowles, Destinee Ditton, Grace James, Grant MacDonalds, & Aaron Goeckner

Hailey Faith, a Biological Engineering student, received the 2024 Outstanding Senior award and the Guy and Grace Wicks Memorial Award, in addition to winning the pitch competition at the Idaho Women's Business Symposium! The UI Outstanding Senior Award is presented to ten seniors who are exceptional leaders at the University of Idaho who have demonstrated outstanding service, leadership, academic achievement and who are committed to serving the University community. The Guy and Grace Wicks Memorial Award is one of the highest honors at the institution, which recognizes senior students exhibiting outstanding success based on GPA, campus activities and service to the university in the spirit of Wicks' legacy. Guy Wicks served the students of the University of Idaho for 34 years before retiring in 1965.

The capstone design Team, that Hailey was part of designed a retrofit to relocate C-arms, commonly used during surgeries for deep tissue X-ray imaging, precisely every time. The C-arms is moved and repositioned, adding an additional 20 to 40 minutes of surgery time during a procedure. The team has earned additional



Hailey Faith wins first-place in pitch competition at the Idaho Women's Business Symposium



Grand Challenge Scholar Graduates Nathan LaVoie (BE) and Paetra Morgan (ChE)

awards exceeding \$10,000 toward developing a device. The new technology could improve the safety of surgical procedures and reduce hospital costs. Their winnings include first place in the Idaho Women's Business

Outstanding Seniors

Each year faculty nominates and votes for the outstanding senior for Chemical Engineering and Biological Engineering. This year's outstanding BE senior was Peter Wieber and outstanding ChE senior was Kaylee Janett.

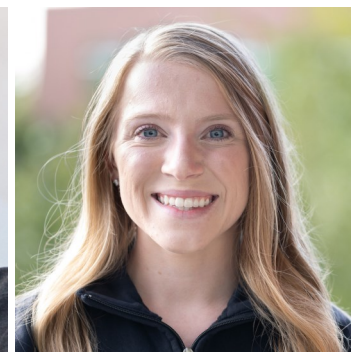


The C-arm capstone team comprised of Biological Engineers, Mechanical Engineers, and Computer Scientists

Peter grew up in Boise, Idaho and is the third of seven children. He enrolled at the University of Idaho as a National Merit Scholar in pursuit of a degree in Biological Engineering. Following a fun-filled experience in organic chemistry, he added a Chemistry degree to his studies. Although his mentors advised against this, the courses aligned and he completed the additional degree. Outside

Symposium Pitch Off in Fort Hall, first place in UI's Idaho Pitch and second place in the technology track of the Idaho Entrepreneur Challenge hosted by Boise State University.

Two Grand Challenge Scholars graduates were also from Chemical & Biological Engineering Department. Nathan LaVoie, a Biological Engineering student, will be working for an Environmental Engineering company cleaning up the waters around Coeur D'Alene, and Paetra Morgan, a Chemical Engineering student is going to work for Micron Technologies.



Outstanding Seniors Peter Wieber (BE) and Kaylee Janett (ChE)

of his course work, Peter has pursued research including studying modified oligonucleotide probes in Dr. Hrdlicka's lab, designing a bioreactor for the mechanical stimulation of neotendons in Dr. Schiele's lab, and creating a methodology for the extraction and

identification of metabolites in barley using GC/MS under Drs. Kayler and Hrdlicka. When he wasn't rock climbing or in the lab, he provided tutoring for chemistry and engineering courses through the university. In the fall, he will be pursuing a PhD in Biomedical Engineering at Cornell.

Kaylee was born and raised on a hay farm in Royal City, WA, where hard work and problem solving was integrated in her daily life. Loving math and chemistry, Chemical Engineering is a good fit for her. While attending the University of Idaho she was extremely involved. Holding three executive board positions in her sorority, including being President. She also was a member of the local AIChE Chapter, where she held the positions of Secretary and President. Kaylee attended two SWE national conferences, where she was able to develop hard and soft skills required for industry. She was also an Engineering Ambassador for three years, where she was able to teach children about the possibilities of STEM careers. Kaylee enjoys spending time with her family and being outdoors. Upon graduating she will be continuing her work as a Process Engineer.

Capstone Design Projects

The National Academy of Engineering ranks UofI's Capstone Design Project as one of top in the nation. Students work on sponsored capstone design projects of their interest.

Capstone projects are exciting endeavors often supported by industry partners. To support student education, the University has a remarkably generous intellectual property (IP) policy. This policy allows us to release the IP back to the sponsoring agency at no cost. By engaging talented young engineers, we've seen industry sponsors develop successful products and innovative tools.

Below, you'll find a list of capstone teams led by chemical or biological engineering students. The project poster and more details about each projects is available from <https://issuu.com/uidaho/docs/expo-capstone-2024>.

Chemical Engineering

Chemical Engineering Capstone projects, generally are not interdisciplinary.

1. **The Sustainable Application of a Pacific Northwest Biochar Off-Gas Stream: (Best Technical Presentations Award)** Sponsored by C6 Forest to Farm (F2F) in Winthrop WA, the project contributes to their mission of reducing forest fire severity and enhancing forest soil health.
2. **Electrolysis for Sustainable Generation: (Best of Show Award)** Sodium sulfate is produced as a by-product in several chemical processes. The team developed a two chamber electrolysis cell to split sodium sulfate into sulfuric acid and sodium hydroxide .
3. **Green Gas: Converting Renewable Energy to Synthetic Natural Gas:** This project models reacting the hydrogen with carbon dioxide emissions to make methane, which can be used as fuel.

Biological Engineering

Most of the projects listed below are interdisciplinary with one or more BE students: The link would take you their project page.

1. **Shock Circuit for Virtual Fence System: (People's Choice Award)** Sponsored by USDA funded Virtual Fence project, the team measures the animal ear electrical impedance and designs a circuit to provide just enough stimulus to keep animals away from where they should not be.
2. **Bioreactor System to Explore Cell Response:** By understanding how our body turns stem cells to heal different tissues, the team designs a bioreactor that uses fluid flow to apply physical forces to stem cells turning them into healing tendon cells.
3. **Relocation Guidance System for C-Arm Medical Imaging:** This project implements image detection as an affordable guidance system with high accuracy and precision to reduce surgery time and radiation exposure.
4. **Ember Generator for Forest Fire Simulation:** To better how embers play a role in spreading forest fires and defend infrastructure, the team designed an ember generator to simulate wildfire conditions and allow for the study of ember propagated fires.

5. **The University's First Foray Into CubeSat Payload Development: (Best Technical Presentations Award)** The Cube Satellite platform reduces wait time to go from the idea phase to the delivery phase. The team designs a payload to attach to a CubeSat that will gather information on radiation in low Earth orbit.

UI Hosts Pacific Northwest Regional AIChE Conference

The department's chapter of the American Institute of Chemical Engineers (AIChE) hosted the 2024 Pacific Northwest Regional AIChE conference in April, welcoming ~100 students from six regional universities. As hosts, UI was responsible for coordinating the regional competitions including Chemical Engineering Jeopardy, research presentations, and the Chemical Car competition. Winners from each competition qualified to compete at the



Conference attendees enjoy the Awards Banquet at the conclusion of the conference

National AIChE Conference this coming fall. Alongside hosting, the UI student chapter also found time to compete in Chemical Engineering Jeopardy, placing second overall! The conference was a great success thanks in large part to the conference sponsors: Micron, Chobani, and the department.

Faculty Awards

Outstanding faculty produces outstanding students. We are pleased to report that two of the four College of Engineering Faculty awards went to Chemical and Biological Engineering faculties.

OUTSTANDING TEACHING AWARD

Nathan Schiele

Dr. Schiele has been a faculty member at UI since 2015. His research focuses on understanding tendon formation to improve therapies for debilitating tendon injuries and has been funded by the National Institutes of Health and National Science Foundation. He is committed to enhancing undergraduate education by providing research experiences in his lab. Additionally, he supports undergraduate research opportunities as the UI Campus Leader and Student Coordinator for the NIH Idaho IDeA Network of Biomedical Research Excellence (INBRE) Program as well as a Faculty Affiliate in the UI Office of Undergraduate Research. Dr. Schiele is also the Faculty Advisory for the Biomedical Engineering Society student chapter, which advances knowledge of the state of art in biomedical engineering and promotes networking with alumni. Dr. Schiele teaches introductory and upper-level courses in biological engineering as well as ENGR 123: First Year Engineering.



OUTSTANDING FACULTY AWARD

Vivek Utgikar

Dr. Vivek Utgikar joined the University of Idaho in 2001. He has also served as the Associate Dean of Research for the College of Engineering and as the Interim Director of the Nuclear Engineering Program. Professor Utgikar's research interests include energy systems, modeling of multiphase systems, and environmental remediation/resource recovery. His teaching portfolio includes a broad range of chemical and nuclear engineering courses including transport phenomena, kinetics, thermodynamics, and energy systems. He is the author of two textbooks in chemical engineering: *Fundamental Concepts and Computations in Chemical Engineering* (2017), and *Chemical Processes in Renewable Energy Systems* (2021), both published by Pearson, Boston. He is a recipient of the Fulbright-Nehru



Academic and Professional Excellence Fellowship for conducting research on the recovery of critical materials from e-waste at the Institute of Chemical Technology, Mumbai, India.

Lou Edwards Endowed Professor

We are delighted that Dr. Steven Gardner will join us as the Lou Edwards Professor in August. Dr. Gardner was a tenured Associate Professor at Mississippi State University in 1995. In 1998 Dr. Gardner left academia and worked twelve years in the flavor and fragrances area as senior process engineer, and then fourteen years in membrane separations area as senior principal R&D engineer. Dr. Gardner has forty peer reviewed publications and authored thirty inventions disclosures, patents, and trade secrets. Many Idaho and regional industries should be able to take advantage of his expertise.

Faculty Research Highlight

It has been a busy year for Dr. Bernards' research group. Over the past year, Dr. Matthew Bernards has been serving as a co-Lead on the Nationwide Eclipse Ballooning Project, a \$6.4 million NASA Science Activation grant being led by Montana State University. In this role, Bernards assembled a team of talented UI students to participate in a high altitude ballooning field campaign during the annular solar eclipse in October 2023 and the total solar eclipse in April 2024. The team leads Kontantine Geranios (ChE graduate student), Caeley Hodges (ChE undergraduate student), and Logan Kearney (operations and supply chain management undergraduate student) kick started this effort by running a training workshop in June 2023 where they trained team leads from four other universities in the equipment set up and operation, data collection, and preliminary data analysis as a larger part of the overall project. Then the leads assembled their own team including six additional undergraduate students from across the College of Engineering, who underwent training exercises at the start of the fall 2023 semester.

The team traveled to Lakeview, OR in October for a 30-hour field campaign launching balloons and collecting data 24 hours prior to, during, and 6 hours after the eclipse. Unfortunately, the annular eclipse hid behind some clouds, but otherwise the field campaign was a success. In

April 2024, the team traveled to North Springfield, PA for an identical 30-hour balloon launch campaign. This time Mother Nature behaved, and the team was able to take in the breath taking total solar eclipse. Data analysis and presentations of the results are on-going, including at the Academic High Altitude Conference in May 2024.



The UI eclipse ballooning team in North Springfield, PA

The Bernards group research projects did not stop here. The group also continued two intertwined projects to develop polymeric coatings that prevent bacteria adhesion with additional funding from NASA. This work includes evaluating the performance of these polymer coatings in gravity impacted conditions, simulated microgravity, and ultimately on a payload that will be sent to the International Space Station on Crew Resupply Mission 31. In August, Dr. Bernards also started a collaborative project funded by the National Science Foundation with Dr. Kristopher Waynant. The focus of this project is to evaluate the impact of subtle chemistry changes on the performance of the polymeric materials that are under development for multiple biomedical applications like preventing bacteria adhesion.

Links and Contacts

LinkedIn: The department shares the College of Engineering page.

<https://www.linkedin.com/company/vandalengr/>

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