

# SEMESTER NEWSLETTER

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## Message from the Chair



The Chemical and Biological Engineering department is fortunate to have a caring alumni base that is coming forward to donate and push for a much-needed change. I believe this partnership

with alumni sets a strong foundation for academic excellence in teaching and research. With support from our alumni, we were able to finish our student lounge, multimedia student meeting room, much needed senior lab upgrades, and we are in the process of purchasing instruments and tools for students. The student lounge is dedicated to the "Nordquist Foundation" for their generous donations.

The Chemical and Biological Engineering department ranked No.1 among all engineering departments for externally funded research this year. The NASA Idaho Space Grant Consortium, directed by faculty member Dr. Matthew Bernards, had the highest research spending among centers. This is not surprising, as the chemical and biological engineering field is a research-active discipline, poised to tackle contemporary issues like human health, energy and the environment on a global scale.

The department puts research and education at the top of its priorities. We are continually looking to increase hands-on activities for students, including establishing new teaching labs, acquiring modern instrumentation for teaching and research, and providing more opportunities for undergraduate research. The department has sponsored undergraduate research, conference travel, participation in competitions, scholarships and student club activities.

The faculty reviews curriculum regularly and makes nec-

essary adjustments that will better prepare students for the everchanging world they serve. The faculty approved the revised Graduate Handbook this semester. The new handbook combines the old chemical engineering and biological engineering handbooks with some updates. The handbook also added requirement for an accelerated 4+1 Masters of Engineering program.

Two significant curriculum changes in both chemical and biological engineering programs are 1) using ENGR 123: First-Year Engineering as the introductory course in engineering, and 2) dropping of ENGR 240: Introduction to Electrical Circuits requirement. ENGR 123 is being taught as a general engineering course to give students a good understanding of engineering while explaining the different engineering disciplines for them to make an informed decision. The department is developing an alternative to ENGR 240 course that will better cater to the students.

The past semester has been challenging. Our university continues to mourn the loss of students, Ethan Chapin, Madison Mogen, Xana Kernodle, and Kaylee Goncalves. The faculty have done their best to accommodate students as needed.

I hope the holiday season was a much needed break for students, faculty and staff to heal. We expect to resume fully face-to-face classes this semester while continuing to accommodate students in need.

As always, we look forward to your feedback. Please feel free to [share your thoughts](#).



## University of Idaho

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## BEL Student Lounge Ribbon Cutting

When it comes to good education, a conducive learning environment plays a big role. The Buchanan Engineering Laboratory (BEL) student lounge and surrounding teaching and research labs present an inviting and lively atmosphere to initiate the exchange of knowledge and spark ideas. This space is configured to provide a **student-centric learning hub**. This hub was made possible by generous donations from alumni and friends including Mark Norquest, David Durrett Powers and family, and Buratto brothers Jeff and Mark. The upgrades include senior labs



From Left: Dev Shrestha, Mark Nordquist, Sally Powers, and Suzie Long

downstairs, teaching labs, and a multimedia meeting room for remote meeting like student-client meetings for Capstone Design projects.

Many friends and family attended the ceremony in person and via zoom. Mark and Sally jointly cut the ribbon. Suzie Long, the Dean of Engineering, explained how alumni and friends can make a significant impact in engineering education, like this one. Other speakers included Dev Shrestha the current chair, Eric Aston—former department chair who initiated the project, Matthew Bernards, the chemical engineering program Capstone instructor, and Mark Nordquist who spoke about his experience with the university and how education was valuable in his career and life. Thanks to Bobbi Hughes and her team in the Development Office for making this a successful project.

## Our Alumni wins R&D 100 Award



Two alumni from chemical engineering graduated in 2020 and 2021 from Dr. Haiyan Zhao's group, Dr. Meng Shi and Dr. Steven Hermann, both INL employees won year 2022 R&D 100 awards under Process/Prototyping category in Electrochemical Leach (EC-Leach) and Robust Anode for Electrochemical in Extreme Environments (Robust Monolithic Anode), respectively. The EC-Leach technology unlocks the green energy potential of lithium-ion (Li-ion) batteries at the end of their lives by allowing extraction and recovery of critical materials. Meanwhile, the Robust Monolithic Anode technology provide long-lasting and highly efficient performance to support both consumer products recycling and spent nuclear fuel reprocessing. The winning team of INL researchers were officially honored for their innovative technologies at the R&D 100 gala event in San Diego on November 17th.

## Students win Grand Challenge awards

Our student numbers may be few but they win proportionately high numbers of prestigious awards. The Grand Challenge Scholars Program is the only program of its kind in Idaho and the Pacific Northwest. The program prepares students to solve the 14 Grand Challenges of Engineering in the 21st century, as established by the National Academy of Engineering. Grand challenge scholars pitched to the UI Academy of Engineers about their project and ideas. The Pitch Event was held on the evening of Nov. 3rd, and our students won both Gold, and Platinum, the highest awards. Nathan Lavoie, a biological engineering senior won the Gold Award and was named the Richard T & Bonnie L. Jacobsen Scholar. Alyssa

Hansten, also a biological engineering senior, won the Platinum Award and was named the DeVlieg Scholar. "The Grand Challenge Scholars Program has been a great program to develop my skills as an engineer. Through it, I have had the opportunity to explore research, study abroad, and showcase the many activities I have been a part of. It provided the structure to build my extracurriculars around while still allowing me the freedom to create my own path. Without the amazing support of my program advisor, Dr. Nathan Schiele, and the generous donors who support the program, I would not have been able to challenge myself to new heights and explore what an engineer is capable of," — says Alyssa Hansten. Nathan Lavoie is planning to pursue M.D. Ph.D. after his graduation.



Nathan Lavoie Pitching to the Academy



Alyssa Hansten with her mentor Dr. Schiele (middle) receiving Alumni Award

Alyssa Hansten also received Alumni Award for her outstanding performance as nominated by her mentor Dr. Schiele.

## Alumni and Professor Emeriti Inducted to the Academy of Engineers

Four chemical engineering alumnus and the former department chair of Biological Engineering was inducted as the Academy of Engineers by the College of Engineering at the University of Idaho. They were:

**Leland Bailey** — 1958, B.S. Chemical Engineering

**Alfred Susu** — 1966, B.S. Chemical Engineering

**Bill Thomson** — 1960, B. S. Chemical Engineering  
1969, Ph.D. Chemical Engineering

**Gordon Bopp** — Former Chair of Chemical Engineer

**Jon Van Gerpen** — Professor Emeritus and former Chair of Biological Engineer



Academy of Engineers Inductees From Left: Joseph Keegan, Don Blackketter, Edgar Vidal, Bill Thomas, Thomas Henderson, Gordon Bopp, and Jon Van Gerpen

## Departmental Student Scholarships

Generous donations from alumni, friends, and faculty through endowment funds allow us to provide supplemental departmental scholarships to hard working students needing them. This year the department awarded just over \$140,000 to 75 undergraduates and 5 graduate students.

In addition to scholarships, funds like Charles and Julian Peterson Endowment allowed us to sponsor two capstone project in biological engineering and to provide undergraduate research funding for advanced battery technology.

## Student Activities

Graduate and undergraduate students' active participation in professional society is critical part of their learning. Four Chemical & Biological Engineering students from Dr. Nathan Schiele's laboratory presented their research at the 2022 Biomedical Engineering Society (BMES) Annual Meeting in San Antonio, Texas. BMES is one of the largest biomedical engineering-focused scientific conferences and hosts over 3,000 attendees. Biological Engineering (BE) Ph.D. student, Colin Marchus, presented his research poster, self-assembled neotendons for evaluating cell-cell junctions involved in initial tissue formation. His conference travel was partially supported by The Frank and Cleda Tipton Endowment for Excellence.

Three undergraduate students, Alyssa Hansten (BE), Destinee Ditton (ChE), and Hailey Faith (BE) also presented their research posters titled "Snail regulates N-cadherin, but other mechanisms may be involved during tenogenesis", "Contrast-enhancing method to visualize tendon in 3D using micro-CT", and "TGFβs as regulators of collagen crosslinking enzymes for tendon tissue engineering, respectively". These undergraduate students and their travel were supported by Idaho INBRE, the National Science Foundation (grant to Dr. Schiele), and the U of I Office of Undergraduate Research. We are grateful for the opportunity to present our research at this conference, and for the chance to network with experts in the field and learn about the state-of-the-art in biomedical engineering.



Alyssa Hansten, Hailey Faith, Destinee Ditton, Dr. Nathan Schiele, and Colin Marchus (left to right) at the 2022 Biomedical Engineering Society Annual Meeting in San Antonio, Texas

Similarly, department supported two chemical engineering students Chaithanya Balumuru and Henrik Goettsche to



Henrik Goettsche, Dr. Vivek Utgikar, and Chaithanya Balumuru (left to right) at the 2022 American Nuclear Society in Phoenix, Arizona

attended and present at American Nuclear Society Winter Expo. "As a student, I consider myself fortunate to have attended the ANS winter conference. Some of the things I was involved in included working as a session assistant for two sessions, monitoring the student office, and—most importantly—getting the chance to chair a session." — says Chaithanya, who is doing her Ph.D. with Dr. Utgikar.

Three chemical engineering undergraduates Paetra Morgan, Aaron Law, and Isaac Blake to attend AIChE annual student conference and compete in the K-12 STEM outreach in Phoenix, Arizona. The objective of this competition is to increase interest, awareness, and excitement for science and engineering in K-12 students and prepare future engineering students and professionals to creatively solve technical challenges in an ethical, environmentally responsible, and socially conscious way.

If interested in supporting Chemical & Biological Engineering students, Please contact Bobbi Hughes, bhughes@uidaho.edu, 208-885-5303

## Degrees Awarded

Undergraduate:

Jedidiah Byers B.S. ChE, Fall 2022

Graduates:

| Student       | Degree | Major | Major Professor |
|---------------|--------|-------|-----------------|
| Aman Gupta    | Ph.D.  | ChE   | Vivek Utgikar   |
| Carson Silsby | M.S.   | ChE   | James Moberly   |
| Lucas Sass    | Ph.D.  | BE    | Dev Shrestha    |

 Congratulations Graduates!



## Nate Schiele Earns NSF Grant to Expand Tendon Research

University of Idaho Department of Chemical & Biological Engineering Associate Professor Nathan Schiele was awarded a \$400,000 National Science Foundation (NSF) grant to build on the scientific understanding of tendon tissue development.

Tendon injuries are common, treatment options are limited, and damaged tendons rarely regain their full strength. Collagen is a major contributor to tendon strength, but much is unknown about the conditions that influence collagen formation during tendon development. Jointly funded through NSF's Biomechanics & Mechanobiology Program and the Established Program to Stimulate Competitive Research (EPSCoR), the grant will go toward defining mechanisms that control collagen development to impact tendon formation, including exposing cells to mechanical stimuli using a bioreactor.

## Virtual Fence for Sustainable Animal Management



A team of researchers from University of Idaho and Washington State University is awarded a \$1 million grant from USDA to develop a virtual fence system. Dr. Dev Shrestha is the Co-Principal Investigator responsible for the engineering part of the project.

Fences are pervasive on grazing lands across the world and ranchers consider the construction and maintenance of fences a necessary cost of livestock production. Affordable virtual fence systems could provide a flexible tool for livestock managers to provide necessary forage for their herds amidst changing climate conditions. In four years this project will result in a system which will be highly relevant to western ranchers. The virtual fencing technology could, like barbed wire over a century ago, be a catalyst that transforms livestock operations and improves economic and environmental sustainability for ranchers across the globe.

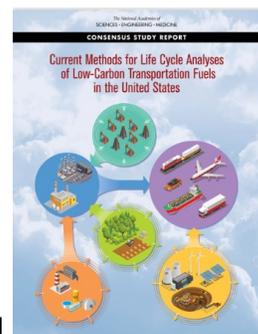
## Lou Edwards Endowed Chair Position

An endowed chair is a distinguished faculty position supported with the revenue from an endowment fund specifically set up for that purpose. The Lou Edwards Endowed Chair in Chemical Engineering will continue former professor Edwards' tradition of excellence in leadership, teaching and research, and enable U of I to attract and retain top faculty members.

The position was advertised in February of 2022 but ended up in a failed search. The failure was mainly due to mismatch between UofI's and the candidate's requirements. This means the search will have to start again. However, the dean of engineering, Suzie Long, plans to ensure success next time by matching expectation with resources. As a result, the position is not likely to be advertised until needed additional resources for startup and salary lines are set.

## Current Methods for Life Cycle Analyses of Low-Carbon Transportation Fuels in the United States

Life Cycle Analysis (LCA) is a tool to quantify the environmental impact from a product such as biofuel and other renewable fuels. However, approach to the life cycle analysis has important limitations that needs to be understood before using the results for policy making. Dr. Dev Shrestha was a study committee member on LCA methods analysis publication conducted by National Academy of Science Engineering and Medicine (NASEM). More about the study is available at: <https://vimeo.com/733370389> and a free report can be downloaded from this [internet link](#).



[LINK](#)

## Links to Connect

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Giving to Chemical & Biological Engineering:

[www.uidaho.edu/giving](http://www.uidaho.edu/giving)