Fall 2020

University of Idaho
College of Engineering

MECHANICAL ENGINEERING NEWS

SUPPORT LAB UPGRADES

Renderings from Design West Architects of proposed renovations to the Senior Capstone Design Suite and Engineering Innovation Studio include installation of wall-mounted, large-screen monitors and a movable partition for product display and meetings with industry clients.

Elevating the Capstone Experience

Senior Capstone Design Suite renovation to drive entrepreneurship and incubate innovative student projects

Over the years, the highlight for the undergraduate senior experience has been the College of Engineering's Interdisciplinary Senior Capstone Design Program. We have collaborated with numerous industry clients throughout the Pacific Northwest and beyond, developing innovative solutions to unique challenges while creating opportunities for small and large corporations to recruit talented young engineers. As a result of our efforts, the capstone design program has been ranked by the National Academy of Engineering as one of the top seven programs in the nation for infusing real-world experiences into engineering education. This recognition

HELP US REACH OUR GOAL OF $250K!

We rely on the philanthropic support of our dedicated alumni, friends and trusted industry partners to bring this amazing project to reality.

For more information on ways to give, contact Bobbi Hughes, Executive Director of Advancement, at bhughes@uidaho.edu.

IN THIS EDITION

makes us proud and eager to continue improving the quality of our capstone experience. Today, the program leverages the utility of our existing Senior Capstone Design Suite, which is a combination of a large workspace area and a smaller meeting room. Students have a dedicated workspace to centralize their team efforts, develop prototypes for their conceptual designs, confer with team members as well as mentors, and display their projects throughout the academic year. The location of the design suite, adjacent to our well-equipped Machine Shop and CAD computer labs, makes it an ideal space to centralize our Senior Design innovation and leadership training. However, the design suite needs upgrades to support the advances we plan to make in our program.

This semester, our department will initiate fundraising for a long-overdue remodel to enrich the student experience in the design suite. A faculty team has worked with Design West Architects Veteran Architect Ned Warnick and student users to develop the model for the new collaborative space. In the concept design, the existing team meeting room will be transformed into a collaboration center for multi-purpose utilization via installation of wall-mounted large-screen monitors and easily movable partitions to allow quick adaptability to various meeting needs. The main workspace area where students in the capstone program design, develop, manufacture and display their products will benefit from the installation of acoustic ceiling tiles to reduce ambient noise and increase comfort, modern furniture to enhance comfort and facilitate collaboration, and aesthetic improvements by repainting and refurbishing existing workbenches. In addition, we plan to install large glass windows adjacent to the hallway, and modern door security access, which will enable after-hours access for students.

The combination of these enhancements will have a transformative impact on our ability to deliver high-quality education and state-of-the-art design experiences for our engineering students. Most notably, this transformation will enable our department to facilitate highly engaging design reviews and leadership training experiences for students. The upgraded spaces will centralize industry collaboration through the capstone design program and promote student-to-student collaboration and active learning. We will be able to showcase senior design projects throughout the academic year more visibly. This will create an inviting STEM environment for student congregation and innovative incubation. A major expected outcome will be increased attraction of high-level engineering talent and growth for our department, as well as better preparation of students to join the engineering workforce. We will be able to facilitate multiple student-centered events throughout the year using the multipurpose studio and collaboration center.

Mechanical Engineering will be working with U of I Architectural and Engineering Services project architect Stephanie Clarkson to manage the improvements. Stephanie brings a wealth of experience in facility stewardship, having overseen the College of Engineering Student Services Center renovation.

(Top) The transformed collaboration center will benefit from the installation of acoustic ceiling tiles for reduce ambient noise and increase comfort, modern furniture to enhance comfort and facilitate collaboration, and aesthetic improvements by repainting and refurbishing existing workbenches. (Bottom) The current Senior Capstone Design Suite does not reflect the caliber of the program. Space constraints limit functionality and creativity.

The project is focused in three areas: critical upgrades, innovation and comfort, and program representation. This renovation project is a top priority of the Dean and the improved space will impact every engineering student's capstone learning experience.

We need to fundraise $250,000 to complete the project and naming opportunities are available at various levels. A generous gift from Bob Parkinson '64 will be combined with department internal funds to seed the project, but we rely on the support of our dedicated alumni, friends and trusted industry partners to bring this amazing project to reality.

Lean Manufacturing: Developing Alternative Delivery

Creating an online version of our popular, three-week Lean Manufacturing short-course this past summer was a challenging proposition. Here are some modifications we implemented to sustain hands-on learning:

Design for Manufacturing and Assembly (DFMA) – Dr. Maughan joined the instructor team and contributed an excellent collection of videos and resources for DFMA that will enrich the course for years to come.

Block Project and Kaizen Project Support – Graduate student Max Johnson created videos of the machining processes required for the Block Project, normally performed by students in the machine shop. Max also served as "Eyes-on-the-ground" for numerous kaizen project teams, streaming live via Zoom from the shop and other locations to provide "current-state" information.

Online Lecture Slides/ Videos – To facilitate discussion during lectures, lecture slides and instructional videos were available before class. Online quizzes reinforced learning and provided real-time feedback.

Virtual Factory Tours – We benefited from substantial efforts made by partners at Schweitzer Engineering Laboratories (SEL) and Vista Outdoors to create synchronous virtual tours of their facilities.

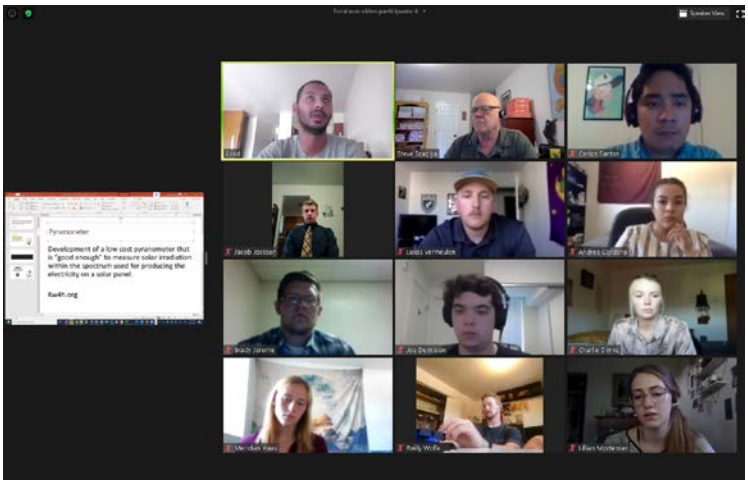
Live Factory Simulations – Graduate Student Christopher Bitikofer developed a clever online version of the factory simulation using the Roll20 platform. Three different student teams proposed modifications to a 'Vandal Car' manufacturing process, assumed different roles on the assembly line, and monitored how these changes impacted factory performance.

Course Assessment – The online version of the course was well received by 20 students who enrolled in our Summer 2020 course. Yes, they would have preferred the face-to-face and hands-on version of the course, just like the faculty and staff. All stakeholders worked hard, maintained positive attitudes, generated quality products, and the course experience was as highly rated as ever.

Interdisciplinary Capstone Design Embraces Online Format

Team formation process has been modified due to ongoing social distancing

By Matthew Swenson, Director of the Interdisciplinary Capstone Design Program



A series of Zoom sessions were created to enable student mingling from project-to-project while representatives from each project were available in each room to discuss and answer student questions.

2020-2021 SPONSORS

- NASA
- NSWCCD Acoustic Research Detachment
- Stanley Solutions
- Advanced Input Systems
- Hyster-Yale Material Handling
- Schweitzer Engineering Laboratories
- Idaho National Laboratory
- U.S. Dept. of Agriculture – Forest Service
- Forest Concepts

Every Fall, multiple engineering disciplines converge to kick-off our annual sequence of capstone projects for the academic year. One of the cornerstone activities for initiating the capstone projects is the team formation process. Within our program, we greatly value the opportunity for students to provide input into their project assignments. Each year, a collection of project options is presented to the students at our Annual Capstone Project Fair, followed by each student formally bidding for their project preferences. This approach enables each student to gain a sense of ownership of their assigned project from day one.

As the University of Idaho has transitioned back to an open campus and in-person classes this fall, the team formation process has been modified due to ongoing social distancing protocols and the number of people involved in the process. This year, the Annual Capstone Project Fair was conducted exclusively in Zoom on September 1, 2020. Through the gracious assistance from our IT department, a series of Zoom sessions were created to enable student mingling from project-to-project while representatives from each project were available in each room to discuss and answer student questions. A total of 42 projects were simultaneously presented to 141 interdisciplinary engineering students using this format. Through the functionality in Zoom, we were able to emulate the in-person Project Fair experience quite well, while also making it more convenient for remote participants to be engaged in the process.

Following the Project Fair and the subsequent team assignments, the same Zoom sessions were repurposed to seamlessly facilitate our Team Formation kick-off activities using the same virtual format.

3D Printer to Revolutionize Biofluids and Biomechanics Research and Education

With the help of a nearly $300,000 major research instrumentation grant from the U.S. National Science Foundation, a team led by Associate Professor Dr. Tao Xing is installing a high-resolution, mixed-material 3D printer like no other. To be housed in the Integrated Research and Innovation Center, this state-of-the-art printer can print large, geometrically detailed and flexible 3D structures. The printer can also produce pieces in extremely high resolution (16 microns) in one exposure,

Tao Xing

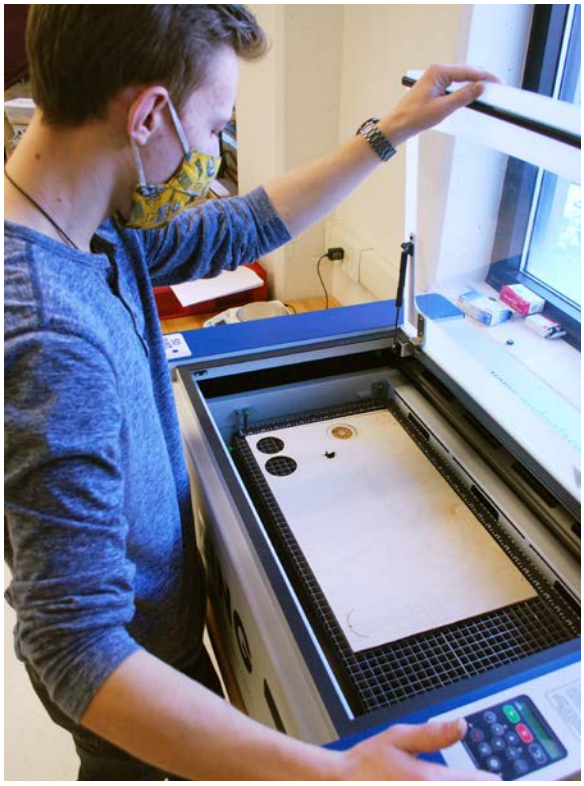
complex printing not possible in other 3D printers. The device will allow researchers to analyze the physical constructs of complex structures to improve understanding of different mechanisms in the body, from lung ventilation to brain-drug delivery, the effect of brain cancer drugs in-vitro and therapeutic approaches to traumatic brain injury. This instrument will facilitate and enhance multidisciplinary research and expand academic-industrial collaborations at the University of Idaho. In addition to training graduate and undergraduate students, the printer will be used in 3D-printing competitions for local K-12 students, and high school students when they attend Women in Engineering Day on campus, which will broaden the participation of underrepresented minorities in engineering, science, physics, and technology.

New Laser Cutter for ME 123/223 Maker Space

New tool perfect for prototyping with cardboard and plywood

By Michael Maughan

Students in our first-year and mid-program design courses now have a new prototyping tool at their disposal. Using student fees, the department purchased a compact, yet powerful, Zing 24 laser cutter made by Epilogue Laser. The machine has a 12”x24” bed and was ordered with an optional 50 W laser power upgrade that is perfect for prototyping with cardboard and plywood, but also able to cut through thicker wood and plastics. In the summer of 2020 the machine was installed in Engineering-Physics Building room 103 utilizing the building’s existing exhaust duct work. Air assist for the cutting process is supplied by a campus air line, keeping the room free of a dedicated compressor. Students in ME 223 will be the first to use the cutter for their design projects this Fall. One of the great features of this cutter is the software, which behaves like a print driver. This approach makes cutting from any software application easier and more accessible to users who haven’t yet developed skills with modeling software.



Mechanical engineering student Alex Chambers uses the Zing 24 laser cutter.

ME 330 Gains Instrument Upgrades

By Vibhav Durgesh

Our junior laboratory course, ME-330, provides hands-on experience for ME students in building electro-mechanical circuits, configuring data-acquisition systems, applying sampling methods in experiment design, and analyzing experimental results. Laboratory infrastructure for ME 330 was upgraded this summer and consideration was given to workstation design that could support HyFlex classes as well as online laboratory sessions. During a regular semester, students in ME-330 would typically work in pairs with equipment, hardware and tools being shared among students. Therefore, in order to manage limitations on resource sharing, we focused on a data acquisition hardware that can provide multiple functions with a single device, is inexpensive, and is easily reconfigurable for use in conducting different experiments. The ME infrastructure committee concluded that the most economical solution would be to update the current data acquisition system to a National Instrument (NI) myDAQ system. This integrates into the NI Engineering Laboratory Virtual Instrumentation Suite (NI ELVIS) and the Digilent protoboard is fully compatible with NI-MyDAQ. Since the NI MyDAQ is compatible with the NI ELVIS environment, we can use it as a virtual signal generator, a digital multimeter, and an oscilloscope.

Weather Under an Eclipse

Students tracking gravity waves, large-scale disturbances in the atmosphere, that help us predict the weather

The team launched high-altitude balloons weekly over the summer and continues to participate in launches during the fall semester.

On Dec. 14, 2020, an eight-student team from the NASA Idaho Space Grant Consortium in the College of Engineering will be in Chile recording gravity waves produced by the complete solar eclipse. Gravity waves are large disturbances moving through an otherwise stable layer of the atmosphere, and they can influence smaller weather events and air turbulence. Junior Lauren Perla joined the team as a mechanical engineer from Sammamish and explains that understanding gravity waves will help atmospheric scientists improve current weather prediction models. The team has been practicing measuring the waves all summer.

In Moscow, the students launch weather balloons into the atmosphere weekly, and each balloon carries a radiosonde—an instrument designed to radio data on weather phenomena like temperature, wind speed and humidity back to earth. When they travel to South America, the students will spend roughly 18 hours launching one balloon every hour in teams of four. Associate Professor Matthew Bernards in the Department of Chemical and Biological Engineering is the director of the NASA Idaho Space Grant Consortium and oversees the project.

Besides Perla, the team includes junior Malachi Mooney-Rivkin in mechanical engineering, junior Alex Chambers in mechanical engineering, senior Leah Davidson in biological engineering, senior Carlos Muñoz in physics, senior Roslyn McCormack in chemical engineering, senior Sebastian Garcia in mechanical engineering and master's student Jackie Martinez-Alvarez in chemical engineering.

ASME Updates and Plans for 2020-2021

By Rachel Stanley, ASME President

Last spring a fundraiser was held through Crowd Funding to raise money for a long-awaited renovation of our student lounge. Through the generous donations of alumni, faculty, friends, and family, we were able to raise $2,500. With matching funds from the Mechanical Engineering Development Fund, we set out to upgrade our lounge.

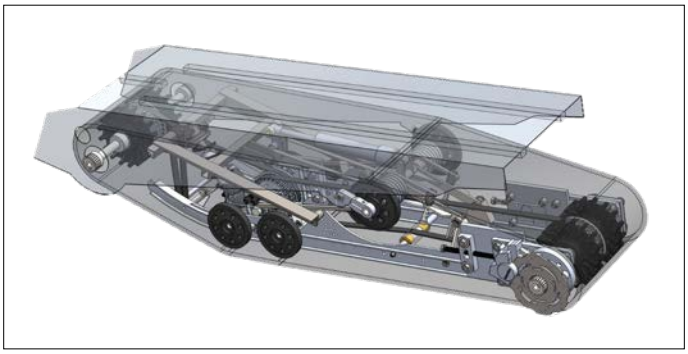
Phase I: We recently received our first shipment of furniture that included a large worktable, three smaller tables, and two campfire tables for students to use with our previously owned couches. There are now more spaces for students to sit, ensuring adherence to social distancing guidelines. This also means that, in the future, there will be plenty of spaces for student collaboration.

Phase II: We have more items on the way, such as a TV for use during meetings and to support presentations, two new tables to hold self-service computers and printer, new matching chairs, two storage cabinets, and a new microwave.

Industry Tours: The ASME club, like many other groups on campus, is experiencing hardships. Unfortunately, due to COVID-19 our annual industry tour in Seattle as well as our smaller industry tours and barbecues will not happen this year. However, this will not stop us from finding opportunities for students to learn about the industry. We already have one virtual industry tour set up to view a nuclear reactor at INL and are planning to organize more. Several industry partners, such as Boeing, have offered to share employee expertise on modern workplace technologies via webinars for U of I engineering and business students. We are looking at events like these to increase student involvement because there are no travel or group size limitations.

Additional updates to the ASME Lounge include a TV screen for use during meetings and new tables.

Crowdfunding Unlocks CSC Innovation



This CAD drawing shows the reardrive project to improve power transfer between the track and snow by moving the drivers from the standard front mounted configuration to the back of the track.

By Dan Cordon

Thanks to the support of over 30 donors (faculty, staff, current students, and alumni), the Idaho Clean Snowmobile Challenge team raised over $3000 last Fall for chassis and ECU development work. One outcome of this investment is that the CSC team was awarded the Oshkosh best design award in the Spring 2020 competition for progress on their reardrive project. This award is given to the team that displays the most innovative or unique design within a subsystem. The ongoing reardrive project aims to improve power transfer between the track and snow by moving the drivers from the standard front mounted configuration to the back of the track.

One third of the amount we raised was matched by Mechanical Engineering Development funds to obtain an OpenECU from Pi-Innovo. This development ECU has the capabilities to run the chassis and engine in the stock configuration while providing the ability to expand auxiliary systems and controls through a central processor. Incorporating new data acquisition and control capabilities have been nearly impossible in the past due to the team's use of donated hardware with proprietary software. A four-person Summer 2020 capstone team embarked on the first leg of the long journey to implement the Pi-Innovo ECU so that its full potential can be realized by the team. This Fall the project is being further advanced by graduating senior Colin Parke and is being passed on to younger members who are collaborating with him via the CSC ME 201/401 Special Topics course.

VISIT THE TEAM WEBSITE

idahocsc.wixsite.com/uicsc

Congratulations to our ME Advisory Board Scholars

Students receive $1,250 scholarships for the fall semester

Describe your interests in mechanical engineering and your future plans.

James Bradley

My interests in mechanical engineering started with the curiosity of problem solving, when seeing a family friend work on his cars or when he took me on a tour of the hydropower dam he worked at. It got me thinking about what can be achieved by problem solving. Just the ability to be able to design something and pursue an idea that could benefit society seemed appealing to me. I have future plans to look into self-sustainable living and to just enjoy my work and I think engineering gives me the chance to improve life and to keep me challenged.

Describe how the scholarship funds would make a difference in meeting personal financial need.

I am a transfer student from North Idaho College and have always dreamed of coming to the University of Idaho, but that idea could not be achieved right out of High School due to having a single mother who went through two divorces which could not provide enough financing to attend. So I decided to make a financial decision to attend a community college to save money. Going to NIC, I made money going and that provided me the step to attend U of I. Having a scholarship from the University of Idaho would help immensely and would allow me to focus on school and my final year at the University of Idaho.

Being an engineering student takes a lot of time and balancing that with work proves difficult at times. But I have been working since 15 and it is doable with drive and organization.

Mark Jaszkowiak

Describe your interests in mechanical engineering and your future plans.

I am interested in the machine design aspect of mechanical engineering. I really enjoy the mechanical design process and plan to work in the automotive industry. I have really enjoyed my mechanical engineering classes here at University of Idaho and cannot wait to get into my career to take what I have learned in my classes to the workplace.

Describe how the scholarship funds would make a difference in meeting personal financial need.

I am committed to graduating from college without taking out any loans. The funds would help me meet my tuition and fees. I am working summers and using my savings to pay for school. I am working very hard to graduate in four years so that I do not have to take out loans.

Building the Future Engineering Workforce

During the 2020-2021 school year, the Society of Women Engineers (SWE) has planned a variety of service and professional development activities in addition to networking provided by our regular meetings. We are partnering with the College of Engineering in offering a virtual Women in Engineering (WIE) Day. High school WIE participants will participate in an engineering activity and have opportunities to engage with women and others who are current students, professors, and industry members in engineering. Later in the semester, SWE members will be participating in the virtual WE20, the world's largest conference for women engineers. To keep our members safe on campus, we are offering a virtual option to all our in-person meetings. We are also implementing a mentorship program to connect freshman and sophomore engineering students with juniors, seniors, and graduate students. To further advance member growth, SWE is working with the College of Engineering to help connect our members with alumni in various industries. SWE is actively pursuing our mission to support diversity in engineering and all students at the University of Idaho.

U of I Society of Women Engineers members pose for a photo at the Anaheim Convention Center during the SWE national conference in 2019.

CONNECT WITH SWE

Learn more about SWE and other clubs at

uidaho.edu/engr-clubs

NEUP Aids Undergraduate Experience

Cody Gibson develops cooling jacket for autoclave assembly

As a senior, I was provided the opportunity to work in Dr. Stephens' research laboratory to upgrade an existing testing apparatus used to perform high temperature-high pressure stress corrosion cracking and fatigue tests. A few years ago, Dr. Stephens was awarded a NEUP Infrastructure Grant to upgrade some existing materials testing equipment. I was awarded a SURF this past summer and developed a cooling jacket for the autoclave/load frame assembly. Proper sealing between the autoclave and load frame testing rod is critical and the previous seal design did not hold up under the intense temperature and pressure. The new cooling jacket implements a fail-safe design, which is critical for the extreme environmental conditions. The new design consists of two separate rod seals along with a second internal chamber.

Cody Gibson's new cooling jacket implements a fail-safe design, which is critical for the extreme environmental conditions.

Tyler Sand Earns DOE Scholarship

University of Idaho College of Engineering mechanical engineering undergraduate Tyler Sand received fellowship and scholarship awards through the U.S. Department of Energy (DOE). Sand, a junior, earned a $7,500 scholarship to cover education costs for the upcoming year.

The Office of Nuclear Energy's Integrated University Program offers undergraduate scholarships and graduate fellowships to students pursuing nuclear engineering degrees and other nuclear science and engineering programs relevant to nuclear energy.

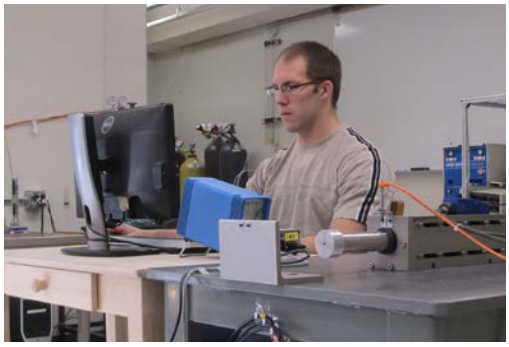
Ninety-three percent of students who have completed nuclear energy-related fellowships through the DOE have either continued to advance their education in nuclear energy or have obtained careers at national laboratories, other government agencies, academic institutions or private companies.

Graduate Student Highlight

Samuel Van Horn, M.S.

Throughout my life, I have always had a desire to improve mechanical systems. When I was in high school, my father gave me my first car, a 1987 Honda Accord LX. It had 300,000 miles on it and burnt a quart of oil every week. Upon graduation, I was accepted into a mechanical engineering program that was 500 miles away from my hometown in Colorado. Living on a limited budget, I wanted to improve the efficiency of the vehicle as I attended college. After attending my first thermodynamic class, I learned that car efficiencies are extremely difficult to improve. As a result, I fell in love with thermodynamics and heat transfer.

After I earned my Bachelor of Science in Mechanical Engineering, I decided to attend the University of Idaho graduate program and chose a research topic related to combustion engines. I had the opportunity to work on a novel experimental apparatus that simulated the single compression stroke of a combustion engine using experimental fuels. I have found



Samuel Van Horn works on a novel experimental apparatus that simulates the single compression stroke of a combustion engine using experimental fuels.

the college of engineering faculty members to be extremely talented and passionate about their fields of expertise. Attending the University of Idaho has provided me the skills and knowledge as well as expanded opportunities to pursue a career in the field of thermal sciences.

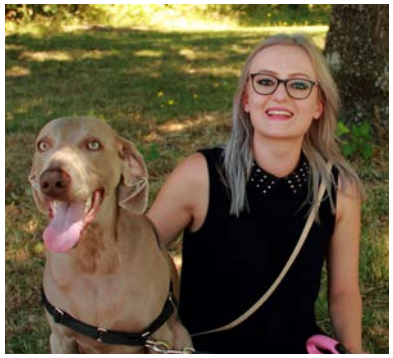
Graduate Student Highlight

Nicolene van Rooyen, Ph.D.

My interest in engineering began at a young age with the age-old cliché of LEGOS. My brothers and I were always building abstract contraptions, usually involving projectiles. This naturally evolved from the curiosity to figure out how things work and why they break. At the core of this was the key question: why do we chose some materials over others?

This question kept popping up throughout my life. I remember playing with broken castings while visiting my mom's office and noticing that some of the fracture surfaces looked a lot different than others. It wasn't until late high school, while my mother was finishing her Ph.D., that I learned microstructures and that we can control them through manufacturing processes.

Still intrigued with how materials influence mechanical design I set my sights on a mechanical engineering degree. This degree combined my interests in materials, manufacturing, and energy systems. In Spring 2020, I decided to pursue graduate school, was charmed by the character of U



Nicolene van Rooyen and her dog Bella

of I, and was fortunate enough to be accepted into the mechanical engineering graduate program as well as Dr. Maughan's additive manufacturing (AM) research group.

My graduate studies will explore localized property manipulation and optimization through pretreating of feedstock and/or material design for AM processes. This focus will help me get a better understanding how material properties influence mechanical performance along with providing versatile technical skills required for industry.

Brubaker Secures LSAMP

By Nick Brubaker

While growing up I was always taking apart mechanical watches and other appliances but rarely remember putting them back together. I was fascinated to see how they worked and to see if I can make them work again or even better. After many failed attempts my dad suggested I would make a good engineer.

I joined the University of Idaho in 2017 after completing an associate degree at my local community college. I chose to double major in physics and mechanical engineering with an emphasis in solid modeling and materials. Being at U of I allowed me to reconnect to my Native American roots. My tribe was defederalized before I was born, and the Native Center gave me the opportunity to learn more about my tribe and heritage. Most importantly it gave a sense of community.

I was accepted into the All - Nations LSAMP - Bridge to Doctorate Fellowship Program last year. This program is specifically to help Native students pursue a graduate degree in a STEM related field. Dr. Maughan and I developed a relationship through my undergraduate career by participating in ASME and talking about our mutual interest in additive manufacturing and material/ mechanical property relations. My graduate work will focus on wire arc additive manufacturing of high entropy alloys for energy applications and wire-fed laser additive manufacturing for commercial use.

Building a Shelter-in-Place Scooter

By Ralph Budwig

We all have seen the rapid changes in electric vehicle technology with electric scooters and skateboards cruising down the streets. About two years ago I decided a great way for me to immerse myself (professional development?) was to design and fabricate a back-country electric scooter for my 11-year-old twin grandsons who live in a rural setting outside Sandpoint, Idaho. As I began to work on the project, my first revelation was that an inexpensive 2.5 horsepower brushless DC motor was available. I was amazed at this level of power for a motor about the size of a grapefruit and weighed less than 10 pounds. I did some testing and ordering of parts, but the project only simmered slowly with work and other commitments. Then COVID came and I had lots of time at home for project work. Thus, I call it the Shelter-in-Place Scooter (SIP).

My grandsons have given it a thorough testing on dirt roads including climbing a 20% grade. I can barely ride the SIP, but they have great balance and experience with dirt bikes. As usual, the prototype reveals all kinds of potential improvements. We will see if there is a SIP2 on the horizon.

Professor Ralph Budwig's grandson tests the Shelter-in-Place Scooter outside Sandpoint, Idaho.

Aerosol Visualizations and Masks Topic of Virtual FARE Roundtable

Professor Ralph Budwig brings expertise to state discussion

In September, mechanical engineering professor Ralph Budwig presented at a virtual roundtable with the Idaho Food, Agriculture, Restaurant and Beverage Establishments (FARE) organization. Budwig, who has taught HVAC Systems as a mechanical engineering technical elective for the past 10 years, presented on Indoor Air Quality (IAQ), especially as related to pathogen aerosol transmission, including COVID-19 in restaurants and beverage establishments.

Ralph Budwig

First, Budwig showed aerosol visualization images obtained by his colleague Professor Christian Kähler of the Military University in Munich, Germany. You can see that wearing a face covering prevents the aerosol stream from being directed at the person you are talking too, for example in a restaurant. However, what happens to the aerosol particles that are dispersed into the room even with mask wearing?

LEARN MORE

View striking images of aerosol stream motion during breathing, shouting, and coughing.

Watch the Video

Budwig went on to describe the two basic IAQ approaches that are used in occupant spaces, dilution and filtration. In residential buildings with operable windows, opening windows and doors can be an effective approach to diluting the airborne pathogens in the rooms of the residence. In sealed commercial buildings it is important that the HVAC system be routinely maintained including changing of filters as well as checking and adjusting air handling units so that appropriate fresh air levels are sustained. An enhancement to filtration is a device that introduces ions into the HVAC airstream. The ions have been shown to cause pathogen particles to stick to each other forming larger particles that can be more easily removed by the HVAC filters.

Gupta Earns AI Certificate

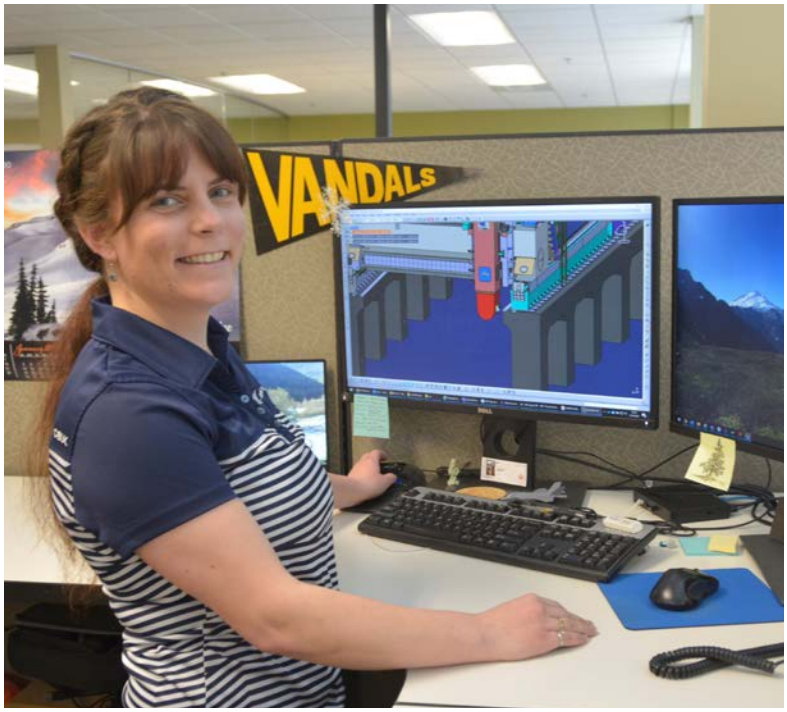
Doctoral student and Research Specialist Ankit Gupta successfully completed the AI Applied and AI Engineering professional certificates offered by IBM. These certificates provide him a firm understanding of Artificial Intelligence (AI), Machine learning (ML), Computer Vision, and their use in a variety of engineering applications. In his advanced programming technical elective offering next summer, Ankit will integrate his expanded knowledge and skills in a course that already spans topics of data types, functions, logic and conditions, classes, methods and input/output and GUI development. The programming platform for this course will again be Python and engineering applications will include data acquisition and analysis as well as controls and automation.

Caitlin Owsley: A Privilege to Serve

Outgoing mechanical engineering advisory board chair reflects on two years served

As we move into fall and this school year is solidly underway, I look back over the last couple years with a mixture of gratitude and sadness. It is still hard to comprehend everything that our local and global community is going through now. But I am encouraged by how, despite it all, we still see incredible ways that people are coming together in our local communities. It is especially exciting to see how young engineers are responding to the challenges that face them.

There were some notable accomplishments in the last years that resulted from the collaborative effort of our industry partners, the faculty, the student leaders and the advisory board. I am proud of the way these people came together for the benefit of the Mechanical Engineering Department. Of significance are the two new lathes for the machine shop and the scholarships that have been awarded to deserving students. The scholarships set an example for other college advisory boards. Thanks to all of you, this was made possible.



Caitlin Owsley '12 works for advanced composite aerospace tooling and parts manufacturer Janicki Industries since graduating from U of I, and has worked as a design engineer, project manager and project engineer.

In addition, many of our board members have been privileged to host student tour groups and join current students at various alumni mixers. These have been great opportunities for students and alumni to socialize and network, which will be valuable in coming years.

It has been a privilege serving on the advisory board and also serving as chair for the last two years. I look forward to passing the torch at our next meeting in early November.

Jacobsen Assistantship Boosts Undergraduate Research

Program honors past alumnus, professor, chair and dean

The Richard T and Bonnie L. Jacobsen Scholars in Engineering Endowment was established in honor of the significant contributions to engineering achievement, leadership, engineering education and service to the profession and society by Professor Richard Jacobsen, retired dean of the College of Engineering, University of Idaho and past president and member of the U of I Academy of Engineers.

The endowment will fund undergraduate student assistantships and boost engagement in the college's Grand Challenge Scholars Program. Jacobsen Scholars will gain valuable mentoring project management and research experience. In honor of Dr. Jacobsen's engineering discipline, preference is given to mechanical engineering students.

Bonnie L. and Richard T Jacobsen

Jacobsen, affectionately known as "Jake", passed away Tuesday, Aug. 20, 2019. He earned a Bachelor of Science from the U of I in 1963 and a Master of Science in 1965. After completing his doctorate, he joined the U of I faculty and climbed through the academic ranks.

MAKE A GIFT

Gifts up to $15,000 are being matched by Jake's family and former ME colleagues.

uidaho.edu/engr-jacobsen

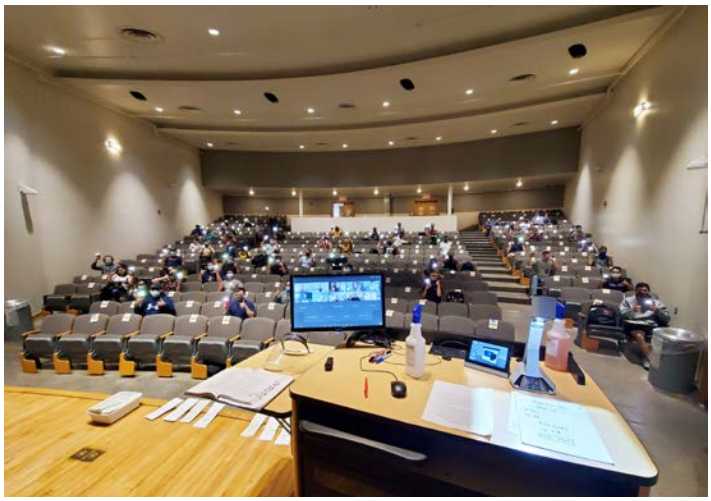
LETTER FROM THE CHAIR

Dear Friends of the Mechanical Engineering Department,

I am happy to write you my first letter as the new Chair of the Mechanical Engineering Department. I have been with the department for a little more than 13 years, starting as an assistant professor, and recently being promoted to full professor. During this time, I have participated in teaching, research and service both in the department and college. Over the years, I have witnessed many changes that have shaped and transformed our department. These changes have been related to personnel restructuring, teaching innovations, new research and infrastructure initiatives, and the modernization of our internal administrative procedures and tools.

Gabriel Potirniche

Although we are facing some challenges due to the current health situation, I know that our future is bright. The keys to our successes have always been the quality and dedication of our students, faculty and staff. Each semester we welcome students who are eager to join our program. I always witness their enthusiasm about getting a solid education, which will allow them to pursue a successful engineering career upon graduation. We have highly trained and dedicated faculty members who work diligently to deliver an outstanding educational experience to our students. They proudly uphold the high standards that have made our department a recognizable brand in engineering education in the Northwest, and, on topics such as design education, even nation-wide.



Mechanical engineering professor Bob Stephens took a photo of his ENGR 350: Engineering Mechanics of Materials students masked and social distanced in his hyflex class.

Our medium- and long-term goals will be to maintain the high-quality education, which combines a robust theoretical understanding of each mechanical engineering area with practical hands-on experience. Our students will continue to apply rigorous engineering principles and methods to create innovative and impactful designs and products. We will also seek to constantly modernize our curriculum. In the last few years, we have introduced several new technical elective courses at the senior level. We recognize the essential role that computers play in society and engineering. Therefore, we will continue to give a strong emphasis to the use of computers and computational methods in the disciplines that we teach. Computer-aided design has been a highlight of our undergraduate curriculum for many years. We are planning to redefine some of the projects in this area by including Virtual Reality and Augmented Reality. In the future, we will also explore the use of Artificial Intelligence in various projects and even in classrooms. Our former department chair, Dr. Steve Beyerlein has recently initiated a college-wide effort to design and implement a new engineering educational experience at the freshman level, which will surely have a positive impact on the learning experience of our incoming freshman students.

A challenge that we have been facing this year has been to adapt our teaching and research activities to the realities imposed by the COVID-19 pandemic. This fall semester our campus is open, and students are participating via in-person lectures. We have been able to provide a safe classroom experience to our students due to the efforts of our university leadership. Great care has been taken in terms of accessibility to COVID-19 testing for students, faculty and staff, installing remote teaching capabilities in classrooms, providing personal protective equipment and sanitizing materials. This semester, most of the mechanical engineering courses have had in-person lectures. Courses with larger enrollments are being taught in the HyFlex format, where students alternate during the week between attending in person and watching online live lectures. While this format does not allow every student to participate in person to every lecture, it does offer some advantages. Students find it convenient that the online broadcastings are recorded by instructors and oftentimes posted online for later viewing. While we try to minimize physical interactions to keep everyone safe, the online communication between students and instructors during or outside actual lectures can be quite effective. It is fair to say that while this crisis has forced us to adjust our educational format, it has

College Earns Full Six-Year ABET Accreditation

All of the University of Idaho College of Engineering's engineering and computer science degrees have been accredited by the engineering and computing accreditation commissions of ABET, the global accreditor of college and university programs in applied and natural science, computing, engineering and engineering technology. ABET accreditation assures that programs meet standards to produce graduates ready to enter critical technical fields that are leading the way in innovation and emerging technologies and anticipating the welfare and safety needs of the public.

"Our college received ABET accreditation through 2026, the best result that can be awarded from an ABET accreditation process," said Larry Stauffer, dean of the College of Engineering. "This is an indication of the level of confidence ABET has in our degree programs and our nationally-recognized curriculum."

Sought worldwide, ABET's voluntary peer-review process is highly respected because it adds critical value to academic programs in the technical disciplines where quality, precision and safety are of the utmost importance.

Developed by technical professionals from ABET's member societies, ABET criteria focus on what students experience and learn. ABET accreditation reviews look at program curricula, faculty, facilities and institutional support and are conducted by teams of highly skilled professionals from industry, academia and government, with expertise in the ABET disciplines.

ABET is a nonprofit, non-governmental organization with ISO 9001:2015 certification. It currently accredits 4,144 programs at 812 colleges and universities in 32 countries.

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also taught us to use advanced online communication methods for education purposes. We have also observed that online learning is no perfect substitute for in-person teaching. Therefore, we look forward to the time when we will be back to our normal operation mode, with classes and other activities taking place in person on campus.

To compensate for reduced visits to our campus, we have created a virtual tour that is posted on our departmental website. We have also intensified our efforts to reach out to our stakeholders by electronic means. As a result, we have observed a significant increase in traffic to our undergraduate degree website, which more than doubled in the last year. We will continue our efforts to increase and improve our online presence. At the same time, we will continue to keep our department and facilities open, so that those who want to visit us can do it safely at any time.

An exciting semiannual event is the Mechanical Engineering Advisory Board meeting. This fall the meeting will occur in early November. At that meeting, the current Advisory Board Chair, Ms. Caitlin Owsley, will step down and a new chair will be elected. I would like to thank Ms. Owsley for her service to our department. Her energy, enthusiasm and wise management of the board activities have benefited our department. Ms. Owsley will continue to be a board member, and we look forward to working with her for the foreseeable future. We also look forward to working with the new Advisory Board chair in guiding us on important tasks, such as freshman and sophomore curricula, student enrollments and keeping our program relevant for regional and national industries.

Over the summer, our undergraduate program has received the renewal of its ABET accreditation. This renewal will be valid for the next six years, and it attests that our department maintains the high standards in engineering education. Next ABET accreditation review will occur in 2026. In the meantime, we are taking the necessary steps to perform periodic assessments of our educational objectives, and to take corrective measures whenever necessary. This will ensure that we can continue to offer high quality undergraduate education to our students.

As I look forward, I see some challenges, but more importantly, great opportunities for our department. I will keep you informed about our exciting initiatives and accomplishments, and I hope you will continue to stay in touch with our department.

Best regards,
Gabriel Potirniche,
Professor and Chair

SAVE THE DATE

ENGINEERING DESIGN EXPO

Friday, April 30, 2021

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