As we continue with our College of Engineering 25th Anniversary, we celebrate our success—a true testament to not only our students, faculty, staff, and alumni, but to our university and community as well.

With the support and demand for the next generation of engineers, computer scientists, and construction professionals, we have built an environment where all can succeed and this Spotlight focuses on several student success stories in research and academics. From national competition wins to national fellowships, our students represent the best across all levels of education and research at Boise State.

Boise State University had a monumental year in 2021-2022 where project awards totaled a record-breaking $68 million and nearly 26,000 donors contributed a record-breaking $56.5 million in donations. I am proud of the contributions the College of Engineering provided to the university as we also saw a record-breaking year for project awards totaling $16.5 million, accounting for nearly a quarter of all sponsored projects. Over the last five years, our research has nearly tripled from $6 million back in 2017-2018.

This year we also announced our Blueprint For Success strategic plan. Over the next five years, we intend to strengthen our culture of innovation and impact by positively advancing students, faculty, staff, our educational community, industry, government and non-profit organizations, Idaho and Idahoans, and more.

We follow the unique Boise State mindset—Blue Turf Thinking—as we empower all to think critically and solve our world’s complex challenges to envision a better future through new approaches to research and service. Our plan is a collaborative and data-driven plan to become a student-success driven college recognized for teaching and scholarship with statewide and global impact.

I am excited to be leading Idaho’s largest and top-ranked college of engineering. We have accomplished so much in just 25 short years, and there has never been a better time to be a College of Engineering student in Idaho than today. With the support from legislature, industry partners, and our amazing alumni base we continue our upward trajectory growing in every aspect of our mission. New state-of-the-art facilities, new curricula, and a plan for the future will allow us to carry forward and serve as the next generation of leaders for our city, state, and country.

Go Broncos!

JoAnn S. Lighty, Ph.D.
Dean, College of Engineering
Professor, Mechanical and Biomedical Engineering
July 1, 2022 marked the 25th anniversary of the College of Engineering at Boise State. With the support of the Idaho State Board of Education and a push from industry leaders, engineering at Boise State began in 1997. The college is a prime example of how quickly success spreads.

Front Cover – 25 Years of Engineering Excellence
## Fall 2022 Enrollment By Degree

<table>
<thead>
<tr>
<th>Degree Type</th>
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<td>Masters</td>
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## Fall 2022 Enrollment By Department

<table>
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<td>Civil Engineering</td>
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<td>Computer Science</td>
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<td>Construction Management</td>
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<tr>
<td>Cyber Operations and Resilience Program</td>
<td>182</td>
</tr>
<tr>
<td>Organizational and Performance Workplace Learning</td>
<td>156</td>
</tr>
</tbody>
</table>

Disclaimer: Undergraduate students who are dual majors are counted in both representing departments. Some graduate students who are seeking doctoral degrees, but have yet to obtain a master’s degree are counted as both a graduate and doctoral student in some departments.
EMMA CAMERON

**Degree:** Mechanical Engineering with a Mechanical Design Certificate

**Future Plans:** Begin a job in the Development at Program at 4 Wheel Parts in San Diego, CA and work with the production of aftermarket off-road parts. The program rotates through the Quality, Manufacturing and Engineering departments.

**Honored Faculty:** Sarah Haight, Lecturer, Department of Mechanical and Biomedical Engineering

**Scholarships:** GLO Scholarship Fund, Gem Scholarship, The Paula B and Oliver W, Jones Family Foundation, Stephen Bufton Memorial Fund, Brown Engineering Scholarship, ISTS Scholarship

AUDREY PARKER

**Degree:** Bachelor of Science in materials science and engineering with an emphasis in chemistry and sustainability

**Future Plans:** Pursue a Ph.D. in environmental engineering at the Massachusetts Institute of Technology to research advanced strategies for greenhouse gas removal

**Honored Faculty:** Dr. Paul Davis, Surface Science Lab Manager, Micron School of Materials Science and Engineering

**Scholarships:** Presidential Scholarship, Capital Scholars Textbook Scholarship, Alumni Legacy Scholarship, Scholarship America, Brown Engineering Award, Materials Science and Engineering Award

ANNA RIFT

**Degree:** Bachelor of Science in Computer Science and Bachelor of Science in Mathematics

**Future Plans:** Become a professor and pursue a career in computer science research

**Honored Faculty:** Dr. Cathie Olschanowsky, Associate Professor, Computer Science Department and Principal Investigator of Adapt Lab

**Scholarships:** Presidential Scholarship

SIERRA SANDISON

**Degree:** Bachelor of Science in Mechanical Engineering, Minor in Computer Science, Minor in Biomedical Engineering, Minor in Applied Mathematics, Certificate of Mechatronics, Certificate of Mechanical Design

**Future Plans:** Expand her current 3D printing company, 3D PrinTcess, LLC and hire her first employee

**Honored Faculty:** Dr. Krishna Pakala, Assistant Professor, Department of Mechanical and Biomedical Engineering

**Scholarships:** Presidential Scholarship, Capital Scholars Textbook Scholarship, ID Robert R. Lee Promise, Miss Idaho Scholarship Program, Spirit Squad

WHAT MAKES A TOP TEN SCHOLAR?

To qualify for consideration, the student must have a 3.8 or higher grade point average and be nominated by their respective deans. Each applicant is then rigorously reviewed based on academic breadth of coursework, research, creative works and publications, presentations at professional meetings or conferences, and community and campus service.
Senior civil engineering student Ulises Trujillo Garcia’s fellowship-supported research project focuses on discovering the impacts of exposure to personal narratives in the classroom. The goal is to ascertain if personal stories in the classroom can help underrepresented students in engineering fields develop a greater sense of belonging and identity as an engineer. Research highlights a positive connection with students’ sense of belonging to an engineering community that is shown to improve retention, academic success, and other important outcomes.

Garcia’s research comes from firsthand experiences as a first-generation, low-income, Latino engineering student building an inspiration to help other underrepresented students have successful, connected engineering journeys.

“My background from a migrant farm-working family has given me a passion for helping and supporting underrepresented students in engineering,” Garcia said. “This will equip me to work on my lifelong commitment to improving underrepresented students’ graduation and retention rates by focusing on mechanisms to transform representation in engineering, which will directly impact the educational outcomes of the most vulnerable students in the country.”

Garcia graduated from Boise State with a bachelor’s of science in civil engineering this spring. He will be attending Arizona State University to join the doctoral program in Engineering Education Systems after receiving four full-ride offers.
The Goldwater Scholarship Program, one of the oldest and most prestigious national scholarships in natural sciences, engineering and mathematics, selected Boise State honors students Pangaea Finn and Josue Torres-Fonseca as 2022 scholars. The program identifies and supports sophomore and junior level students who show exceptional promise of becoming the next generation of research leaders in these fields.

The two Boise State students join an exclusive group of the 417 students who received awards from a pool of 1,242 nominated students representing 433 academic institutions this year.

Torres-Fonseca is a computer science major who’s passionate about natural language processing and spoken dialogue systems. Through his research, he hopes to create intelligent systems that enhance the lives of users who are deaf, blind or have other disabilities. His goal is to attend graduate school in Spain or Germany through the Erasmus Mundus European Masters Program in Language and Communication Technologies. Torres-Fonseca’s research mentor, Assistant Professor Casey Kennington, also mentored Boise State’s 2018 Goldwater scholar, Daniele Moro.

Torres-Fonseca is grateful to those who believed in him and who recognized the positive effect that his work will have on others. “Research doesn’t have much of an impact in the world if others don’t believe in it and its potential because much of the work can’t be done alone.”

Nine Boise State students – now including Finn and Torres-Fonseca – have received the Goldwater Scholarship since 1991. The Honors College and its fellowship advisor Kate Huebschmann support candidates throughout the application process.

"The scholarship has already had a huge impact on my career and that was before even receiving it. I had the honor of working with Kate to make my application as strong as possible, which was important because not only did it give me a higher chance of receiving the scholarship but also significantly helped me apply to other research opportunities."

- Josue Torres-Fonseca
BUILDING IDAHO’S CONSTRUCTION MANAGEMENT LEGACY
Illustrations provided by Lombard/Conrad Architects

UNIQUE DONOR LEVEL OPPORTUNITIES

- **Ultimate CM Supporter** ($1,000,000+)
- **CM Bronco Supporter** ($250,000-$999,999)
- **Platinum Donor** ($150,000-$249,999)
- **Gold Donor** ($100,000-$149,999)
- **Silver Donor** ($50,000-$99,999)
- **Bronze Donor** ($10,000-$49,999)
- **Blue Donor** ($5,000-$9,999)
- **Orange Donor** ($1,000-$4,999)

DONOR LEVELS WITH LASTING IMPACT

For more information about how you can make a lasting impact please contact Scott Jurgens at scottjurgens@boisestate.edu, or scan the QR Code for direct giving.
Boise State University’s Construction Management department took 51 students to Reno, Nevada, to field seven teams for the national Associated Schools of Construction competition held the second weekend of February.

The Electrical Team received top honors in their national category, while the Project Management Team placed third in their national category. Teams also competed at the regional level of the competition, with the Commercial Team and Design-Build Team both finishing second in the Region 6 competition.

“BSU continues to outperform many of the top Construction Management programs in the nation. This is a testament to the quality of our Construction Management Department, our faculty, and our industry partners,” said Interim Department Chair Anthony Perrenoud. “But the true reason for the success is the students. They are extremely dedicated and highly competitive. Everyone performed exceptionally, it was a pleasure to see them participate and to be awarded for their hard work.”

During the competition, teams meet with industry problem sponsors in the morning and are presented with problem statements on complex construction projects. Teams then have around 18 hours to develop and prepare solutions including a detailed estimate, project schedule, staffing, safety, technology, and sustainability plans. The following day teams give a formal presentation of their solution to the group of professional constructors who worked on the actual projects.

“Participating in the Reno Competition fosters growth in many aspects. As a first year participant, I learned more about real world construction processes than I could have imagined,” said Haley Arnaudo, Vice President of Women in Construction and CM student.

This year’s Associated Schools of Construction National Competition featured more than 1,331 students who comprised 181 teams from 53 different universities. Boise State Construction Management finished the competition with a success rate of over 50 percent. Finishing only behind Cal Poly San Luis Obispo (10) and tied with Oregon State (4) in total teams placed by one university.

The ESI Building for Construction Management will be Boise’s first “mass timber” structure. Mass timber uses technology to glue, nail, or dowel wood products together in layers to create structural panels, posts, and beams that are strong and environmentally friendly.
In the Fiber-optics, Lasers, and Integrated-photonics Research (FLAIR) Laboratory, senior Ellie Schlake and her mentor, Nirmala Kandadai, assistant professor of electrical and computer engineering, are working with NASA’s Marshall Space Flight Center to integrate fully flexible hybrid electronic nanomaterial devices manufactured in space.

Schlake’s proposed project collaborates with the Advanced Nanomaterials and Manufacturing Laboratory and Idaho Microfabrication Laboratory to explore a new optical sintering technique for printed thermoelectric nanomaterials used in thermoelectric energy harvesting and power generating devices used in space.

“I have been one of the only girls in my engineering classes, but ever since I took an electrical engineering course I knew it was my passion,” Schlake said. “The discipline is challenging, broad, but most importantly, it is innovative. I do not want to merely experience the future of technology; I want to take part in creating it.”

Schlake is a part of the Accelerated Masters Program in the College of Engineering, giving her a head start in her graduate studies which she will begin this fall continuing her education in the department of electrical and computer engineering at Boise State.
TOP TEN SCHOLAR PARKER NAMED TAU BETA PI FELLOW

Materials science and engineering senior Audrey Parker was selected to a 2022 Tau Beta Pi graduate fellowship. Parker is one of 31 selected fellows out of 278 applicants.

The Boise State University Top Ten Scholar graduated this month with a bachelor of science in materials science and engineering with an emphasis in chemistry and sustainability. This fall she started her graduate studies at the Massachusetts Institute of Technology in environmental engineering.

Parker received the Donald A. Stark Fellowship. The fellowship is supported by a gift from a charitable trust named for the man who contributed much to progress in the fluid-power industry. Parker’s fellowship includes a cash stipend of $10,000 for her advanced study.

Her research earned her a spot in the Massachusetts Institute of Technology Summer Research Program in the summer of 2021. While at MIT, she joined a global network of researchers dedicated to environmental sustainability, primarily strategies for greenhouse gas removal.

I feel deeply honored and humbled to have been selected as a Tau Beta Pi Fellow. The fellowship demonstrates a dedication and commitment to advancement in engineering, which I will strive to embody throughout my graduate school experience. I feel truly grateful to continue the legacy of the award.

- Audrey Parker
Boise State students from the Mechanical Engineering Club took home a first place finish for Best Innovation in the Human Powered Vehicle category of the American Society of Mechanical Engineers E-Fest Digital Competition.

The Enginerds received the top award and $500 prize for their innovative approach creating a lightweight, efficient, and user serviceable human powered e-trike, designed to reduce the downtime due to maintenance. Their concept was based on pre-design interviews conducted with local Boise bike shop owners about issues they faced.

“We didn’t overthink the design,” lead designer and engineering senior Chris Dagher said. “We were able to make it simple by limiting our scope and constraining ourselves to create something that would give us the ability to create, test, and then reiterate helped set us apart from the competition.”

The Enginerds learned from previous finishes and experiences passed down from previous competition submissions to help them prepare for this year’s competition, helping them record their best finish in competition history.

The team’s design featured a gearbox that can be 3D printed to improve the user serviceability of regular e-bikes. Through testing by the team at each stage, the gearbox design proved to be fabricatable which met the innovation of user serviceability.

The design also included a focus on user serviceability with open-sourced software allowing users to tweak and adjust the motor settings to their individual liking and needs. The team spent countless hours in the Engineering Innovation Studio applying calculations and applications from engineering courses to their design.

The e-HPVC category, sponsored by Altair, is an engineering design and innovation competition where students can apply engineering principles through the design, fabrication, and racing of human powered vehicles hosted by the American Society of Mechanical Engineers.

“This competition combines everything you learn to the physical hands-on fabrication with welding and millwork, giving us that experience and ability to create a product from knowledge and application.”

- Julianna Buzzard
The National Science Foundation awarded nearly $5 million to Boise State’s College of Engineering as part of its scholarships in STEM program, the largest such grant awarded to a group of higher education institutions in Idaho. The six-year award will help with the recruitment and retention of students across the state with $3.6 million in scholarships and create easier pathways into engineering and computer science careers for students who have limited options for continued higher education access.

The grant will establish the Center for Advanced Energy Studies Scholars Consortium with the College of Western Idaho and College of Southern Idaho. Over 150 low-income students will receive scholarships to begin their academic journeys before transferring to Boise State where the scholarship will continue to support their degrees.

Don Plumlee, associate dean of academic affairs and associate professor of mechanical and biomedical engineering, is the principal investigator on the project. He believes the project will help build a cohort-like experience for students across Idaho through an existing relationship with the Center for Advanced Energy Studies.

“This is an incredible opportunity for Idaho and Boise State as we begin building a better engineering and computer science educational ecosystem through our community college partnerships,” said Plumlee. “New pathways into technical careers will support Idaho industry and have a positive impact on our rural communities as well.”

The grant includes a research component to investigate how the new pathways created for students across southern Idaho will improve self-efficacy, engineering and computer science identity, increase access and improve retention through the transitions along the pathways. Findings will be shared with the entire STEM community in the larger effort to support and build engagement with students and to gather insights into the specific degree programs that attract them.

“We’re going to be able to make recommendations to better support students interested in pursuing STEM careers, even those who have never seen themselves as cut out for these challenging paths,” said Katherine Wright, associate professor at the College of Education. “Helping students see themselves as valued members of the STEM community will produce research findings that will go beyond Boise State and even Idaho.”

Wright is one of three other co-investigators from Boise State on the project. Other co-investigators include College of Engineering Associate Professor Sondra Miller and Center for Advanced Energy Studies Associate Director David Estrada. The project also features associate professors from the College of Education and College of Engineering like Carl Siebert, Jerry Fails and Kurtis Cantley, as well as Amy Moll, director of the Micron School of Materials Science and Engineering.
The College of Engineering (COEN) is established July 1, with construction management, instructional and performance technology, civil engineering, electrical engineering, and mechanical engineering as the founding departments.

Lynn Russell becomes the founding dean of COEN.

Boise philanthropist Velma Morrison announces a $2 million donation from the Harry W. Morrison Foundation for the construction of a civil engineering building.

Computer Science joins COEN. From 1997 to 2001, COEN more than doubled from 656 to 1489 students.

Cheryl B. Schrader becomes the second dean of the college.

Micron Technology Foundation pledges $2 million to start a baccalaureate program in materials science and engineering.

Amy Moll becomes the third dean of the college after serving as Interim Dean.

The new $25 million, 98,000 square-foot Environmental Research Building, designed to foster collaboration across disciplines, opens its doors.
The College of Engineering breaks ground on the Micron Center for Materials Research Building through a $25 million gift from the Micron Foundation.

Boise State University opens the Micron Center for Materials Research for classes in the fall semester.

The Department of Computer Science relocates to the downtown Boise City Center Plaza.

Boise State University establishes a new interdisciplinary doctoral program in computing.

The Department of Materials Science and Engineering becomes the Micron School of Materials Science and Engineering.

JoAnn S. Lighty is named the fourth dean of the College of Engineering.

As part of the 20th Anniversary celebration, the engineering building is renamed in honor of former university president Charles P. Ruch.

The College of Engineering celebrated 25 years of engineering excellence with ‘an unshakable focus on learning’ on July 1, 2022.

Today, the Boise State College of Engineering has quadrupled in size to over 2700 students to become the largest engineering college in the state of Idaho and in 20 years since the first doctoral degree program began, the college will award its 100th doctoral degree.
The College of Engineering rang in the new year with a Micron Technology Foundation gift of $585,000 to help support the establishment of the college’s Micron Student Success Center (MSSC).

Micron’s gift is just the latest in the long-supported relationship between the company and Boise State University. The Micron Technology Foundation gift is part of the company’s commitment to support programs that expand equitable access to education, diversify enrollment, and prepare all students for productive and fulfilling engineering careers.

The MSSC is the first step of many the College of Engineering has planned as part of Boise State’s newest strategic plan - Blueprint for Success. This multi-year plan aims to establish the College of Engineering as a leading, student success-driven college recognized for teaching and scholarship excellence with statewide and global impact.

"The growing data economy – fueled by AI and 5G across the cloud, intelligent edge and devices – promises many opportunities for our people to make advancements in memory and storage, and Micron believes that cultivating a diverse pipeline of talent is critical to jump-starting the next wave of innovation. As a leading technology company founded and headquartered in Idaho, we want to share our resources to empower students in our local communities to succeed as future engineers.

- April Arnzen, Micron Technology Chief People Officer and Micron Foundation President"
Student Connections

The Student Success Center has three specific objectives for all engineering, computer science, and construction management students:

- Career Connections
- Leadership Skills Connections
- Continued Connections

The College of Engineering’s MSSC will help improve visibility of available student services and provide all students equal access to early career success by helping them chart a course that combines academic and future goal opportunities.

The center builds a diverse community for all students, fostering experiential learning, mentoring, internships and valuable life skills. The center also allows students to create interpersonal connections across the university and amongst peers.

The Scholarship Pledge

As part of the Micron Foundation’s gift, a Student Success Center Scholarship endowment was established. Already, through the generosity of Micron and Idaho Power, the endowment pledges are $250,000.

We are asking industry, alumni and friends to partner with us to enable students to participate in the programs and obtain important scholarships to help them meet their career objectives. Our goal is to have $500,000 in the endowment by 2025, yielding over $20,000 annually in scholarships and stipends for student participation. While any donation will help a student, donations of $25,000 or more will be recognized on a permanent display, and may be pledged over five years.

For more information about how you can make a lasting impact please contact Scott Jurgens at scottjurgens@boisestate.edu, or scan the QR Code for direct giving.

Micron and Idaho Power have been major supporters of engineering, business and STEM education at Boise State for the last 25 years. Their lead gifts, totaling $250,000, are an indication of their commitment to student success and career opportunities in the College of Engineering.
Dr. David Estrada, Ph.D
- Navy Veteran
- Bachelor of Science, Electrical Engineering, 2007
- Associate Professor, Micron School of Materials Science and Engineering
- Associate Director, Center for Advanced Energy Studies
Dr. Pete Barnes  
**2021 Distinguished Scholar**

Dr. Pete Barnes, the Graduate College’s 2021 award recipient, has long been considered a top student in the Micron School of Materials Science and Engineering. Barnes completed his undergraduate degree from Boise State in 2014 before joining the graduate program in 2015. During this time, Barnes was no stranger to awards throughout his time in academia.

“It is a privilege to have my thesis considered as one of the most distinguished of the graduate college, especially since I know the amazing work of my peers,” Barnes said. “They pushed me to achieve more than I thought possible and I hope they continue to be that beacon as they begin their careers at universities, national laboratories, and industry.”

Barnes’s research, “Nanostructured Niobium Oxides as Negative Electrodes for Lithium and Sodium Ion Batteries,” focused on new synthetic routes for novel metal oxide electrode materials for rechargeable batteries. This research has the potential to accelerate the discovery of new energy materials and effectively reduce the cost of development.

Barnes’s work has been published in seven high impact peer-reviewed journal publications including Chemistry of Materials, Journal of Power Sources, and Journal of Materials Chemistry. His research publications provide insights on important issues such as how we can discover new avenues to make materials of practical importance, how battery degradation can be used to effectively accelerate development of commercial sodium ion batteries, and how ordered nanomaterials can be created with the use of electropolishing and anodization.

Dr. Evan Smith  
**2020 Distinguished Scholar**

Dr. Evan Smith, the Graduate College’s 2020 award recipient, has a long and heavily involved academic resume. Before completing his bachelor’s degree in Applied Mathematics with a minor in Physics, Smith came from Cerro Coso Community College in California, where he received associate degrees in mathematics, engineering, general science, and liberal arts.

Smith transferred to Boise State in 2014 to complete his undergraduate degree before starting graduate school in MSMSE in the fall of 2016. Upon his arrival in Boise, Smith joined the Boise State Undergraduate Microgravity Research Team his senior year, as well as the MSE Club, Phi Kappa Phi honor society, Students Helping Integrate Fellow Transfers (SHIFT), Ski and Snowboard Club, and the Bowling Club.

“With all the high quality research being conducted in our department, I’m honored to be the first recipient of this award from MSMSE,” Smith said. “It feels great to be recognized for all the hard work that I put into my research.”

Smith’s research, “Empirical Modeling of Structural Distortions in Perovskite Ceramics” focused on developing predictive models for composition structure-property relationships specifically for electroceramic materials. These models can significantly accelerate the development of new materials and effectively reduce the cost of the development.

Smith’s work has been published in five first-authored peer-reviewed journal papers giving insights into important issues such as how industry can save significant amounts of time and money, how new materials and devices can be developed effectively at an accelerated pace, and how accurately behaviors or phenomena can be predicted. Smith’s research has already inspired work by other scientists as far as Egypt and China.
xperiential learning and hands-on experiences for students is a critical feature and cornerstone for the programs in the Boise State College of Engineering. This summer, students in the Department of Organizational Performance and Workplace Learning (OPWL) have taken this one step further – pro bono style.

Claudia Achilles, Scott Harrington, Alejandro Maya, Halah Mohammed, and Patricia Tjan are the five OPWL students in Seth Martinez’s Learning Strategy Lab who provided evaluation services to the international nonprofit organization, Humentum, to help them improve their training courses to become more rigorous and robust.

“The Humentum project taught me so much about evaluating courses, cognitive psychology, and learning science,” OPWL graduate student Claudia Achilles said. “Not only did I learn from and with my peers, but the confidence and knowledge I’ve gained from the whole experience will never leave me.”

Humentum is a global nonprofit that provides humanitarian and development organizations like World Vision, Habitat for Humanity, and others with training and consulting services to improve the operation and processes for a more equitable, accountable, and resilient community.

Week by week over the summer semester, the students learned various, rigorous instructional design components and then examined and evaluated four courses –two synchronous and two non-synchronous courses provided by Humentum.

“The Humentum project gave me an opportunity to experience courses in a different way,” Achilles said. “I’ve gained so much confidence about bringing ideas to leaders in my company, having this experience has made my job easier and made me more comfortable.”

The Learning Strategy Lab group produced an executive report of findings from the four courses of study. The team was able to identify areas where Humentum could improve the rigor of their courses benefitting other organizations and also applied better learning science strategies, like design accessibility, to improve course outcomes. Martinez said the report of findings has led the team to pursue journal publication, which they are still waiting for.

“There is a need to holistically and creatively design accessibility into every part of e-learning,” OPWL graduate student Halah Mohammed said. “Learning objectives are one of the first ways to incite learner readiness, interest, and motivation. A lot of this evaluation experience encouraged me to ask a lot of questions before making assumptions or relying heavily on my prior knowledge which I am grateful for.”

When Martinez joined the College of Engineering a little over a year ago, he brought with him his connections and experience to start the Learning Strategy Lab, an homage to Martinez’s previous experience as a learning strategist with Facebook. In the lab, students and affiliated researchers are focused on researching how learning impacts performance in organizations.

Dr. Martinez told me once to follow my curiosity and that advice hasn’t failed me so far. Get involved in a research lab, find something you are interested in and go from there.

- Claudia Achilles
FLEXIBLE, STACKABLE PROGRAM CREATES ONE-YEAR MASTERS OPPORTUNITIES

A college journey is unique to every student. For many students, a typical degree path can take anywhere from three to four years, but thanks to the asynchronous online Cyber Operations and Resilience Program, or CORe for short, graduate student Elizabeth Khan was able to obtain her graduate degree in only a year.

With the help of the CORe program, Khan found the chance to transition to a new career path that envelops and leverages all of her past experiences with a new network of cybersecurity connections across the country.

“I consider this program unique in that the instructors are all industry experts in their various subjects,” Khan said. “This means they bring applied knowledge to the classroom and having that knowledge of industry fosters great networking opportunities.”

The program launched in the Fall of 2021, just as Khan’s pursuit of a graduate degree in cybersecurity began. CORe immediately piqued Khan’s interest due to its ability for personalized, stackable courses and certifications to build a degree unique to her. Through the program, Khan was able to obtain her Master of Science in Cyber Operations and Resilience with engineering and analyst certificates.

“It was a super exciting and intense experience,” Khan said. “Intense because the program is designed such that an ambitious student, like myself, can complete the whole program in a year.”

The online asynchronous program prepares students from all backgrounds for a career in the booming cybersecurity industry. The program offers the ability for students with technical and non-technical cybersecurity backgrounds the same opportunities, and also offers a chance for military members, working professionals, and students from any undergraduate background a chance for further professional development.

From the moment she spoke with program director Sin Ming Loo, she knew the Boise State CORe program was exactly the program for her.

The multitude of engaging cybersecurity topics she was exposed to during the program have inspired Khan to continue training toward additional cybersecurity credentials.

“I felt confident that the Boise State program offered something that I hadn’t seen elsewhere. The graduate CORe program was geared toward a wider audience, not just a technical one, meaning that business leaders and entrepreneurs like myself could undertake this program without having to be a coder or have a technical background.

- Elizabeth Khan
NEW FACULTY AND FACES

Robyn Mattison
Clinical Associate Professor
Civil Engineering

BJ Albertson
Clinical Assistant Professor
Construction Management

Eklas Hossain
Associate Professor
Electrical and Computer Engineering

Dean Wilkinson
Clinical Assistant Professor
Electrical and Computer Engineering

Hanna O’Hearn
Lecturer
Mechanical and Biomedical Engineering

Sophia Theodossiou
Assistant Professor
Mechanical and Biomedical Engineering

Seth Martinez
Assistant Professor
Organizational Performance and Workplace Learning

Ria Roy
Clinical Assistant Professor
Organizational Performance and Workplace Learning

Jelena Pokimica
Clinical Assistant Professor
Organizational Performance and Workplace Learning

Jamie Fink, Communications Specialist, Office of the Dean
Alex Flink, Electronics Technician, Research Affairs
Manuela Estrada Garrido, Research Administrator, Office of the Dean
Jamie Hayward, Management Assistant, Electrical and Computer Engineering
Scott Jurgens, Director of Development, Office of the Dean
Linda Kaufmann, Administrative Assistant II, Materials Science and Engineering
Ally Bea Smith, Management Assistant, Materials Science and Engineering
Kim Wilcox, Management Assistant, Materials Science and Engineering
Dr. Casey Kennington

**Integrating Interaction, Embodiment, and Emotion to Transform Language Models**

How might the way children learn and use spoken language help people and computer systems communicate better?

Kennington’s research takes its inspiration from how children learn language. By mirroring their “natural language processing,” he thinks we can better teach robots and other automated computer systems to speak with and understand us at home and at work, lowering barriers to technology use with improved safety and accessibility.

When children learn language, they interact with others to learn words that denote physical entities and events. Like all people, they often respond emotionally, and embody how they feel in their behavior. Contrast this with how computer systems learn language. Scientists mainly use static text as language models to train systems. In the study, people will interact with small robots that move heads, bodies, arms, and eyes. They will describe the emotions that robot behavior seems to project. Researchers will include these perceptions in a new model, and eventually train robots to use it as they interact with people and learn language from them. The study will also result in important datasets to advance future research.

Further, Kennington will integrate outreach with local and rural Idaho schools. Hands-on exposure to artificial intelligence and robots can contribute to workforce development in the sciences in an underserved region and among diverse students.

Dr. Mahmood Mamivand

**Advancing Nanostructure & Interface Science for Permanent Magnets Without Rare Earth Materials**

Can we develop sustainable alternatives to the rare-earth magnets sourced almost entirely outside the U.S. that we need for our phones, wind turbines, and electric vehicles?

Mamivand’s research aims to advance fundamental understanding of mechanisms underlying nanostructure formation in permanent magnet alloys during magnetic-field-assisted manufacturing. This knowledge will pave the path toward developing a novel permanent magnet composed of earth-abundant elements that can outperform state-of-the-art permanent magnets at high temperatures. Current high-temperature permanent magnets use rare earth elements such as neodymium and dysprosium and the U.S. mines only a small fraction. Therefore, developing alternatives can reduce dependence on these materials and improve U.S. economic and energy security.

An integrated education plan strengthens the scientific workforce with an unusual program for Idaho high school and college students to work on authentic machine learning projects together, and through teacher professional training.
In fiscal year 2022, 422 Boise State sponsored project awards totaled a record-breaking $68 million. The College of Engineering totaled $16.5 million accounting for a quarter of all sponsored projects at Boise State. As a college, research expenditures have nearly tripled in the last five years.

David Estrada, associate professor in the Micron School of Materials Science and Engineering: $3,150,000 award for Air Force Research Laboratory grant for project “2D Nanomaterial Inks for Advanced Manufacturing of Hybrid Integrated Silicon Photonics.

Lan Li, associate professor in the Micron School of Materials Science and Engineering: $2,586,200 award for U.S. Navy Office of Naval Research grant for project “Design of DNA -Templated Molecular Dye Aggregates for Excitonic-Based Nanoscale Quantum Gates.

Krishna Pakala, assistant professor in the Department of Mechanical and Biomedical Engineering: $595,445 award for National Science Foundation grant for project “Self-storytelling Interventions to Promote Student Success and Retention.

Jim Browning, associate dean of research affairs in the College of Engineering: $530,650 award National Institute of Biomedical Imaging and Bioengineering/National Institute of Health grant for project “An Engineered Robotic Plasma Array for Large Area Surface Decontamination.

Mojtaba Sadegh, assistant professor in the Department of Civil Engineering: $498,999 award for U.S. Department of Interior for project “Machine Learning approach to forecast human-caused wildfires at actionable scales across the western United States.”

Edoardo Serra, associate professor in the Department of Computer Science: $498,405 award for National Initiative for Cybersecurity Careers and Studies for project “Provence Graph for Advanced Traffic Analysis.

Zhangxian Deng, assistant professor in the Department of Mechanical and Biomedical Engineering: $479,500 award for National Science Foundation grant for project “MRI: Acquisition of Broadband and All-in-One Optical Workstation for Micro-scale Vibration and Topography Measurement.

Mahmood Mamivand, assistant professor in the Department of Mechanical and Biomedical Engineering: $361,453 award for National Science Foundation grant for project “Advancing Nanostructure and Interface Science for Permanent Magnets without Rare Earth Metals.

Erin Mannen, assistant professor in the Department of Mechanical and Biomedical Engineering: $352,141 award for U.S. Consumer Product Safety Commission for project “Infant Lounging and Seated Products Positioning.


Jerry Alan Fails, associate professor in the Department of Computer Science: $299,999 award for National Science Foundation for project “EAGER SaTC: Evolutionary Insights into Digital Ecologies of Fear.

Bhaskar Chittoori, chair and associate professor in the Department of Civil Engineering: $286,316 award for Idaho Department of Commerce grant for project “Novel pavement bases using geocells with MICP treated infills.”
2022 Distinguished Alumni Service Award

Tucker Robb ‘11
Construction Operations Manager, McMillen Jacobs Associates;
President, Boise State CM Alumni Chapter
Construction Management

Since graduating as a top engineering student with a bachelor’s degree in Construction Management in 2011, Tucker Robb has flown high professionally and with his alma mater. Robb is the construction operations manager with McMillen Jacobs Associates, working on projects like bridges, dams and parks across 10 states, from Idaho to Texas. He managed the $4.7 million Kathryn Albertson Park design-build project, which won an Idaho Top Projects People’s Choice Award.

His career in service is also impressive. Since 2013, he has held the position of president of the Boise State Construction Management Alumni Chapter, where he has promoted the program, and organized fundraising events that have raised thousands of dollars for the chapter, program and students. The annual Construction Management Golf Tournament continues to break fundraising records and pairs students with alumni in the industry. He’s also a member of the Construction Management Industry Advisory Board, where he provides financial and in-kind support for the Construction Management program, gives academic direction, and focuses on ensuring students learn skills and concepts relevant to the industry.

Robb has dedicated years of service to the Construction Management program at Boise State and to the community of Boise and the Treasure Valley. He is a mentor and committed to helping Boise State students succeed in their major and beyond the classroom. He is a scholarship donor and a frequent volunteer.

In his free time, Tucker enjoys traveling the world with his wife, Emily, whom he met in college. They share a love for the great Idaho outdoors and spend many weekends in the mountains together.

2022 Distinguished Alumni Award

Marianna Budnikova ‘13, ‘14
Senior Android Software Engineer, Dropbox Inc.
College of Engineering

Marianna Budnikova is passionate about her work in the tech field, serving as a senior android software engineer on the HelloSign Mobile team at Dropbox. The dual degree College of Engineering (Computer Science) graduate also supports women in the tech industry. She is dedicated to growing the diverse pipeline in the tech field and inspiring women to pursue STEM careers.

While at Boise State, she co-founded the Boise State chapter of the Association for Computing Machinery Women, co-founded and acted as president of Girl Develop It Boise, and served on the Board of Directors of WiSTEM, a non-profit that supports STEM education for girls in Idaho. In 2016 Budnikova gave a TEDx Boise talk about how to empower women and girls to pursue careers in tech. An immigrant, she understands the value of financial support to international students and how it helps students achieve their American dream. She and her husband Allen Benz, also a Boise State alum, founded the Margaret Hamilton Scholarship for Women in Computer Science at Boise State and have contributed to it since 2015.

Budnikova has given multiple talks, and written several Dropbox blog posts on using analytics to enhance user and developer experience. Before working for Dropbox, she used data science and machine learning techniques to answer complex questions about augmented and virtual reality user engagement and sentiment for the Microsoft HoloLens team.
SCHOLARSHIPS DRIVE STUDENT SUCCESS

Scholarships are an important component of the College of Engineering’s strategy to improve efforts on student success. As the largest engineering college in Idaho, the college continues to grow and expand to meet the demand for a growing workforce in engineering, construction management, computer science, and cybersecurity. Students in COEN are graduating with critical thinking skills and experiential learning yielding higher success after graduation in their careers and their continued higher education journeys in graduate programs across the country.

SEEK TO INCREASE COEN CURRENT USE SCHOLARSHIP FUND TO $20,000 BY FY2023-24.

IN 2020-21, COEN SUPPORTED 200+ STUDENTS WITH OVER $320,000 IN SCHOLARSHIPS.

A GOAL TO REACH ANNUAL SCHOLARSHIP SUPPORT OF $500,000 BY 2025.

WE INVITE YOU TO INVEST

For more information about how you can contribute please contact us.

Scott Jurgens
Director of Development
College of Engineering
scottjurgens@boisestate.edu
(208) 426-2563

"I remember being scared to take this step in life, but I am so glad I did. It’s been the hardest yet most rewarding experience of my life. Coming from an immigrant background where resources were so slim, you never even imagine having the slightest opportunity to attend college. But thankfully, scholarships are available for financial support. I hope one day to be able to give back to others."

- DeAnna Andrade
INDUSTRY ADVISORY BOARD

The Industry Advisory Board provides counsel to the dean to support the long-term strategic objectives for the college. Current board members are:

Karen Baerlocher  
Alta Science & Engineering, Inc  
Noel Bakhtian  
Lawrence Berkeley National Laboratory  
Yvette Barrios  
Amazon  
Chris Brandt  
Boise Cascade  
David Butzier  
AECOM  
Chris Byrne  
POWER Engineers  
David Eagleton  
ON Semiconductor  
Timothy Forhan  
3rdGear LLC  
Jim Gasaway  
Kount (retired)  
Wayne Hammon  
Idaho Associated General Contractors  
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Micron Technology, Inc. (retired)  
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Tom Loutzenheiser  
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Lynn Russell  
COEN Emeritus Professor  
Linda Somerville  
Micron Technology, Inc.  
Marcene Taylor  
Marcene Taylor, Inc.  
Maria Tindall  
HP Inc. (retired)  
Marianne Walck  
Idaho National Laboratory

IN MEMORY OF

Dr. John Alfred Smythe III  
March 6, 1958 - March 26, 2022

On the brisk Spring Break morning of March 26, 2022, Dr. John Alfred Smythe III (better known as J3) was heliskiing the pristine slopes of Utah with his two sons, having the time of his life, when he abruptly skied to the side of the open mountain, carefully sat down in the gleaming sun-speckled snow, closed his eyes, and climbed into the Lord’s arms. The coroner would list his cause of death as cardiac arrest.

John was a dedicated member of our College of Engineering’s Industry Advisory Board which he served on from 2019 to 2021. John also served on the advisory boards of the Micron School of Materials Science and Engineering at Boise State University and the University of Washington’s Department of Material Science. John earned his Master’s and Doctorate in Materials Science and Engineering from the University of Washington. In 2002, John made his career move to Micron Technology. He joined Micron as a senior technologist and progressively assumed more responsibilities as lead of the materials and process development group. While he joined Micron in Chemical Vapor Deposition, he spent most of his Micron career leading projects in the Technical Development and Pathfinding Teams.

During his 20 years at Micron, John’s unique vision for new materials led to high-impact, innovative projects, some that have enabled technology for multiple generations. When he retired from his 41 years in the Semiconductor Industry, John was Distinguished Member of the Technical Staff and leading pathfinding technology groups spanning all process technologies for DRAM.

In total, John was an inventor on 693 patents with 349 patent applications still pending. Along with these achievements, prior to his retirement John received the Career Achievement in Technology Collaboration Award from EMD Electronics.
SAVE THE DATE!

BRONCOS GIVING DAY
MARCH 2–3, 2023
#BRONCOSGIVE
broncosgive.boisestate.edu

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