COLLEGE OF ENGINEERING

REPORT 2025







BUCKNELL ENGINEERS DON'T WAIT FOR THE FUTURE.

They Build It.

Some people study trends. We set them. Bucknell engineers aren't interested in what's already possible — they're too busy making what comes next. From sustainable systems to lifesaving technology, they don't wait for the world to change. **They change it.**

MAJORS

Chemical Engineering
Civil Engineering
Computer Engineering

Biomedical Engineering

Computer Science & Engineering

Electrical Engineering

Environmental Engineering

Mechanical Engineering

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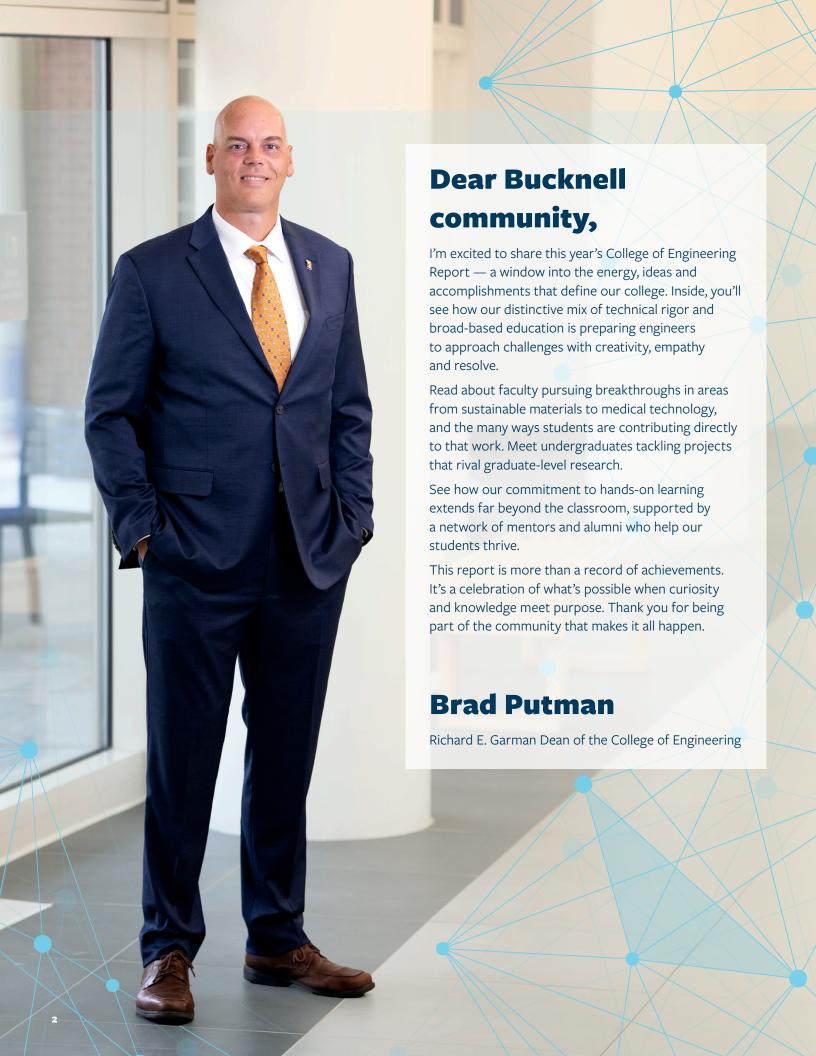


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Bucknell's College of Engineering is nationally recognized for its distinctive blend of technical excellence and liberal arts breadth, preparing students to lead with creativity, empathy and innovation. See how students and faculty are using this approach to tackle challenges in accessibility.



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College of Engineering faculty are leading important research in areas like sustainable materials and medical technology, while giving students the chance to contribute in meaningful ways.



8-9: Beyond Their Years

Bucknell engineering students aren't just preparing for the future — they are shaping it. From researching cleaner energy for aviation to developing biometric health care apps, students are tackling projects typically seen at the graduate or professional level.



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At Bucknell, learning extends beyond traditional classrooms and labs. Spaces like the Bucknell Farm and makerspaces buzz with activity as students roll up their sleeves to develop creative solutions to real-world problems.



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Bucknell's strong community of peer mentors, alumni and staff supports engineering students, helping them navigate challenges, build connections and thrive both in and out of the classroom.



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Bucknell's College of Engineering drives innovation and impact. With vital support from generous donors, it prepares students to lead with confidence and excel.



REDEFINING WHAT IT MEANS TO BE AN ENGINEER

Engineering isn't just about formulas and prototypes — it's about people. Bucknell engineers think bigger, blending technical mastery with creativity, empathy and entrepreneurial grit to solve problems that matter. It's purposeful innovation, designed to change lives.





Top-ranked, Forward-focused

2026 U.S. News & World Report Highlights*

- **No. 7** Undergraduate Engineering Program (Non-doctorate Institutions)
- No. 3 nationally in Civil Engineering, Electrical Engineering and Mechanical Engineering
- No. 4 nationally in Computer Engineering
- No. 7 Most Innovative Schools

Bucknell's College of Engineering ranks among the best, reflecting the college's commitment to preparing students for careers shaped by creativity, empathy and global awareness.

The college's interdisciplinary, liberal arts model prompts Bucknell's engineering students to engage deeply across disciplines, developing the collaborative leadership and entrepreneurial mindset needed to navigate today's complex challenges. It's a philosophy that shapes every facet of the Bucknell experience, from classroom learning to hands-on research and community and industry partnerships.

Faculty and students alike pursue projects that demonstrate how the intersection of technology, culture and human-centered values can drive meaningful, real-world impact.

This philosophy isn't just a concept — it's an active part of students' learning and research experiences.

For example, Professor Annie Ross (left), computer science, researches what makes technology accessible — or not — through a liberal arts framework that assesses how digital tools and culture shape concepts of accessibility. Together, Ross and **Aura Chuck Hernandez '27** (far left), a computer science and English — literary studies double-major, examined how local businesses can make their digital presence more accessible to people with disabilities.

In a collaboration with Bucknell's Small Business Development Center, Ross and Chuck Hernandez worked with small business owners to understand how more navigable and accessible websites can improve the customer experience, and potentially improve sales and search engine optimization results for their clients.

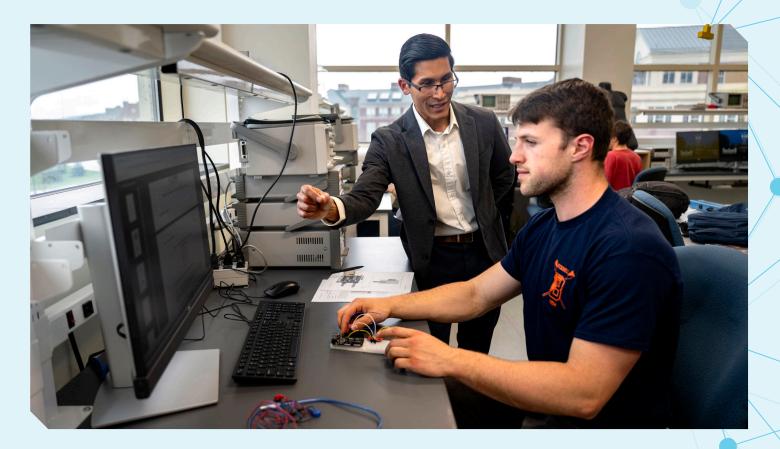
Student researchers are also applying innovative technologies to accessibility challenges in global contexts. **Tiduo "Titus" Weng '26** (bottom left), computer science & engineering, is developing a program under the guidance of Professor SingChun Lee, computer science, that translates Chinese Sign Language into American Sign Language using extended reality (XR) technology.

By capturing hand signals with a camera and processing visual data with machine learning, Weng hopes to integrate this program into XR platforms to enable real-time sign language translation through VR glasses or headsets, demonstrating how Bucknell's distinctive educational model empowers students to create inclusive, forward-thinking solutions.

*Not all majors are ranked individually by U.S. News & World Report. Some of Bucknell's engineering disciplines are not evaluated and therefore are not reflected in these rankings.

ENGINEERING A BETTER WORLD — TOGETHER WITH STUDENTS

In Bucknell's College of Engineering, world-class faculty aren't just advancing their own research — they're partnering with students to address real-world challenges. From biomedical technology and smart power grids to sustainable bioplastics and aviation, these experts are solving complex issues facing our global society while mentoring the next generation.



Innovating Health

Professor Karlo Malaga, biomedical engineering (above, left), is committed to both cutting-edge research and student mentorship. He brings large research-institution experience to Bucknell's close-knit community.

Malaga specializes in deep brain stimulation, a technique used to treat neurological conditions like Parkinson's disease. At Bucknell, Malaga has partnered with Geisinger neurosurgeons, leading student teams to develop predictive models for personalized therapeutic stimulation. His most recent work, published in the *Journal of Neurosurgery*, identifies key stimulation targets in the subthalamic nucleus for improving Parkinson's treatment.

His passion for research doesn't just stay in the lab. He integrates real-world applications into his teaching, ensuring students gain hands-on experience in brain-computer interfaces, neural modeling and medical technology. Malaga believes in fostering curiosity in his students. When one student approached him with an idea to control a drone using brain waves, Malaga didn't hesitate — he helped refine the concept and provided the tools to bring it to life.

"Here, at Bucknell, I get to know my students personally," he says. "I can mentor them closely, support their ideas and help them grow into the engineers, scientists and clinicians they aspire to be."



Powering the Future

Professor Vaji Farhadi, electrical & computer engineering, focuses on making power grids smarter and more resilient using artificial intelligence. She uses machine learning techniques to help control systems quickly respond to power grid disruptions. Her research addresses complex challenges in distributed networks, including smart grids, future-generation cellular systems and cloud computing. Farhadi actively involves students in every stage of her work, from designing algorithms to interpreting results. "At Bucknell, the interaction between faculty and students is so strong," she says. "Teaching is taken seriously, and I really love that." Farhadi's mission goes beyond research — it's about empowering students: "The most important thing they can learn isn't just the content. It's to be observant, to ask if something can be made better, and to believe they can make even a small contribution."



Reinventing Aviation

Bucknell students interested in aerospace engineering learn from Professor Greg O'Neill, mechanical engineering, who is tackling major challenges in modern aviation — from integrating electric aircraft into national airspace to designing noise-reducing morphing wings. His research could reshape the future of flight, and students are his co-pilots. In his Aircraft Design Competition course, O'Neill's students design, build and fly their own aircraft. After years at a large research university (he received his master's and doctorate from MIT), O'Neill was drawn to Bucknell's tight-knit academic community. "I get to work one-on-one with undergrads who are just as excited about this field as I am"



I want to do a good job and make sure my students get what they need. I love that Bucknell gives me the creative latitude to do that.

Professor Greg O'Neill

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Scaling Sustainable Solutions

Professor **Hannah Yocum M'16**, chemical engineering, uses metabolic engineering to develop sustainable bioproducts. "We found you can take the genes that code for the enzymes that make a bioplastic and put them into another microbe and make more bioplastic," Yocum says. By moving these genes into yeast, she hopes to scale up production for uses like medical implants and compostable packaging. She is also exploring how leftover sugars from farming and food production — known as waste sugars — could be used to fuel the process instead of resource-heavy crops like sugarcane, making the process even more sustainable. Yocum exemplifies Bucknell's commitment to hands-on undergraduate research and mentorship. She actively involves students in her lab, guiding them through real-world scientific challenges and giving them the experience and confidence to innovate.



Keeping Drivers Safe

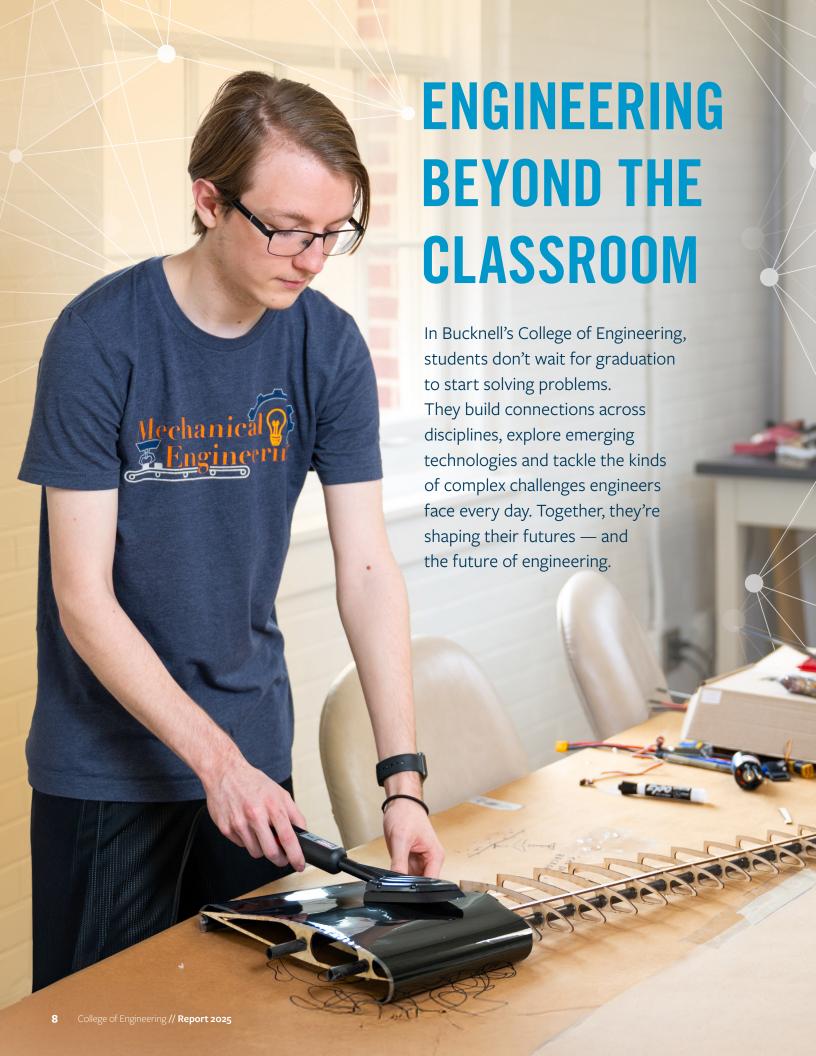
When a vehicle strikes a guardrail or crash cushion, the outcome depends on how well those safety features are designed. That's where Professor Doug Gabauer, civil & environmental engineering, comes in. His research focuses on injury risk in roadside crashes, using crash data, test reports and computer simulations to evaluate whether national safety standards reflect actual injury patterns. Backed by a National Cooperative Highway Research Program grant, Gabauer is assessing whether current limits on vehicle compartment deformation — how much a vehicle's structure crushes inward — accurately predict serious injury risk. The project also involves Bucknell students, giving them hands-on experience with research that has the potential to improve roadside safety standards and save lives.

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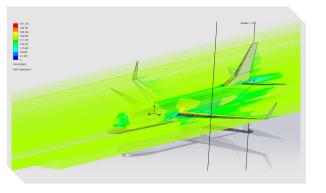
It's rewarding to collaborate with students on research that makes roads safer.

Professor Doug Gabauer

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Josh Hauck '26 used a SolidWorks Flow Simulation computer program to study how air moves around his aircraft design and measure the drag force it experiences.

Fueling New Frontiers

For **Josh Hauck '26** (left), mechanical engineering is more than a major; it's a launchpad for tackling big-picture challenges across disciplines. Working alongside Professor Greg O'Neill, mechanical engineering (see P. 7), Hauck has explored innovative energy recovery methods aimed at decreasing fuel consumption and the environmental footprint of commercial flights. That research led him and a team of student engineers to design, build and fly a custom aircraft for the American Institute of Aeronautics and Astronautics' Design/Build/Fly Competition. Hauck also attended the 2024 American Institute of Chemical Engineers Annual Meeting to compete in the Chem-E-Car Competition. "These projects expanded my knowledge in engineering-related topics while also preparing me for my future career," he says.

Tech for Good Health

Genesis Evbenaye '27 arrived at Bucknell with a clear mission: to improve health care and address the racial disparities her community had experienced in the medical system. Through Bucknell's dual-degree program in computer engineering and management for engineers, the Posse Scholar is gaining the technical skills and business mindset to turn ideas into action. She's currently developing a health care app that uses biometric data to deliver accurate, personalized diagnoses. The goal: to empower users with vital health information while helping to reduce racial and systemic barriers that can stand between patients and care. Her computer engineering studies provide the tools to analyze complex biometric data, while her management coursework fuels the entrepreneurial vision to bring her innovative app to market.

Building Toward the Big Picture

At Bucknell, **Jonathan Cabrera '26** turned his interest in project management into practical experience. Through the Engineering Success Alliance and the Engineering EXCELerator program, he built a strong support network to help him navigate the rigors of the five-year, dual-degree program in civil engineering and management for engineers. His interdisciplinary coursework, paired with his membership in the Society of Hispanic Professional Engineers, connected him with industry leaders. Those experiences led to an internship with Whiting-Turner, one of the nation's largest employee-owned general contracting and construction management firms — a major step toward his career goal. "My civil engineering and management coursework have helped me see a future in project management."



Smart Tech, Smarter Teaching

Starting college in the age of artificial intelligence,

Nicole Waxman '28 (far left) was eager to explore how
this technology is reshaping education. Her electrical
engineering classes gave her both the skills and the spark
to dive in. Teaming up with Professor Stu Thompson
(left), the John P. & Mary Jane Swanson Professor in
Engineering & the Sciences, Waxman began investigating
how AI can streamline feedback between professors
and students. The project grew, bringing in Professor
Robert Nickel, electrical & computer engineering, and
Professor Janet VanLone P'28, education, to examine
AI's broader impact on higher education. "This research
has helped me connect what I'm learning in different
classes," Waxman says.



WHERE IDEAS TAKE SHAPE

At Bucknell, hands-on experience isn't limited to the classroom. It happens in places like cutting-edge makerspaces filled with high-tech tools (see P. 12) and in the open air of the Bucknell Farm (pictured). These facilities give students opportunities to test ideas, build prototypes and tackle challenges in meaningful, tangible ways.



Cultivating Engineers

Planting Seeds

From their very first semester, Bucknell engineers engage in hands-on experiences to identify problems and develop practical solutions for partners like the Bucknell Farm. The farm is a student-powered, regenerative operation that combines organic, year-round vegetable and fruit production with agroecological techniques — all while promoting sustainability and supporting the local community.

- Engineering students begin this journey in ENGR 100, a foundational course that introduces first-semester students to the design process through sustainability-focused projects that use the farm as a basis for their work.
- This foundational class introduces students to the design process through hands-on, farm-based projects — including the development of composting systems and aerobic digesters — giving them practical experience in solving real-world challenges.

Designing Solutions

By the time they reach their senior year, engineering students have built a deep well of knowledge, and Senior Design challenges them to put those skills to the test by solving problems for clients.

- This past academic year, a team of mechanical engineering students developed a human-powered harvester (pictured).
 Their hand-crank design reduces physical strain and increases the efficiency of harvesting green beans, a crop in demand at local food pantries.
- Another mechanical engineering group designed a large-scale compost tumbler to accelerate composting at the farm.
- A team of computer & electrical engineers created a remote automation system for the farm's hoophouse to enhance year-round crop production.

A Living Lab

In addition to traditional laboratories, faculty and students leverage living laboratories such as the Bucknell Farm in research and coursework.

- Professor Kat Wakabayashi, chemical engineering, and his students are working with the farm's composting facility to evaluate the biodegradability and environmental impact of polylactic acid composites.
- Professor Margot Vigeant, chemical engineering, worked with students to characterize the nutrition, appearance and taste of farm produce and compare them to grocery store produce.
- Professor Matt Higgins, civil & environmental engineering, is conducting sustainability-focused research with two program directors at the Bucknell Center for Sustainability & the Environment, Shaunna Barnhart and Olyssa Starry, along with the Heinemann Family
- Professor in Engineering, Nate Siegel, mechanical engineering. Their work includes developing an anaerobic digestion system to manage and convert campus food waste into renewable energy and fertilizer.
- In Sustainable Design, taught by Professor Deborah Sills, civil & environmental engineering, students evaluate the economic and environmental sustainability of projects ranging from compost systems and rainwater collection to orchard fencing.
- In Biomimetic Materials, taught by Professor Donna Ebenstein, the William C. & Gertrude B. Emmitt Memorial Chair in Biomedical Engineering, students partner with the farm to implement systems like swales and berms that reduce runoff and irrigate the orchard.



Tinker, Test, Create

Bucknell's three makerspaces are vibrant hubs where curiosity sparks innovation and ideas transform into tangible solutions. More than just workshops, they're creative labs with support staff that help students bring their visions to life. At the Maker-E (pictured), located within the Dana Engineering Building, students focused on electronics, programming and tech-driven projects find the resources and community they need to push boundaries. Equipped with state-of-the-art tools, the Maker-E puts the power of discovery into the hands of curious creators.



Unlocking Innovation: The Portal Box Project

Bucknell's makerspaces are built on a commitment to open access, empowered creativity and smart accountability — made possible by a student-created system called the Portal Box. Developed in 2015 by a Senior Design team working with Professor Margot Vigeant, chemical engineering, the system regulates equipment access based on a user's verified training. A decade later, Bucknell students are continuing to refine the project, making it a living, evolving part of campus maker culture.

The Portal Box system includes three parts: an access point (glowing acrylic boxes) controlling equipment use; embedded software managing and logging user interactions; and a database and web portal tracking training and activity. Students insert RFID cards to activate equipment. If

training is complete, the box glows green to authorize use. Maker-E staff and student managers oversee access via the online database, adjusting permissions, adding new equipment and tracking usage and maintenance.

Today, **Matt Lamparter '06**, director of electrical & computer engineering laboratories, leads the Portal Box project, which he and the Class of 2025 Senior Design engineers recently updated to its fourth generation. "We know the broader maker community could benefit from our design," he says. Now open source and free to any lab, the latest version was presented at an international makerspace symposium in August — a testament to how student ingenuity continues to power innovation at Bucknell, and beyond.

GUIDING THE NEXT GENERATION



Helping First-years Find Their Footing

The transition to college can be overwhelming for first-year students, especially those entering the demanding world of engineering. To ease that adjustment, Bucknell's College of Engineering launched the Garman Guides mentorship program in 2020. Now entering its sixth year, the program has become a crucial resource for fostering connection and community.

"It was clear that students needed more than just academic guidance," says **Liz Clark '16**, the College of Engineering's student success coach. "They needed someone who could walk with them through all the unknowns — someone who had been in their shoes and could be that consistent, relatable presence."

Garman Guides pairs incoming students with trained upper-level students who provide mentorship in small groups of about five students. The program helps students with everything from understanding course requirements to finding study partners or simply navigating life on campus.

"Our mentors go through significant preparation," Clark says. "We talk about what it means to be vulnerable and how to show up authentically so mentees feel comfortable doing the same."

The Garman Guides program is now integrated into the curriculum as ENGR 099, a required course for all first-year engineering students. With 47 mentors serving during the 2025-26 academic year, Garman Guides now also offers support to students pursuing a dual engineering and management track.

"I had a great experience in my Garman Guide group as a first-year student, and I wanted to give new students the same — or better — experience," says **Christian Owens '26**, a chemical engineering major from Throop, Pa. "This program showed me the power of meaningful connections and welcoming spaces. It's also made me a stronger communicator and mentor — skills I'll carry into my career after Bucknell."

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This program shaped my sense of community within the College of Engineering. The activities gave me a better understanding of what Bucknell has to offer.

Christian Owens '26

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It's incredibly rewarding to watch students grow and succeed, knowing I played a small part in their journey.

Winnie Okello '10

Passing It On

When **Winnie Okello '10** (left) transferred to Bucknell from Lehigh Carbon Community College through the Bucknell Community College Scholars Program, she felt grateful but also stressed. Without a built-in support network, she leaned on faculty, staff and alumni to help navigate the challenges of college life.

Mentors like **Frank Davis '82, P'13** and **James Tucker '07**, both engaged alums known for supporting Bucknell students, offered guidance and reassurance to Okello, helping her navigate campus life. "The hardest part of college isn't the coursework — it's handling life's complexities and the unknowns," she says. Inspired by the support she received, Okello has since mentored more than 15 Bucknell students. "I get just as much from the relationships as I give," says Okello, who majored in civil engineering and now works as a parks and recreation equity program specialist for the Pennsylvania Department of Conservation and Natural Resources in Harrisburg. "It's about being there when they need support and showing them they don't have to do it alone," she says.

One of the most meaningful connections was with **Minh-Anh Phan '22**, whom Okello met by chance while she was on campus for a Bucknell Engineering Alumni Association meeting. Their conversation evolved into a lasting relationship, with the two connecting at least twice a month via Zoom throughout Phan's time at Bucknell.

INTERESTED IN MENTORING BUCKNELL ENGINEERS?

A great way to get involved is by joining the Bucknell Engineering Alumni Association Board (see P. 17), where you can mentor students, support programs and shape the next generation of Bucknell engineers. Learn more at go.bucknell.edu/BEAA.

POWERED THROUGH GENEROSITY

Bucknell's College of Engineering is dedicated to expanding hands-on learning opportunities for students and investing in faculty excellence. It consistently develops the kind of innovative, crossdisciplinary programming that prepares the next generation of engineers for success and impact.

Donor funding fuels this development, supporting student research projects, experiential learning grants, faculty fellowships and student scholarships. Through the generosity of Bucknell alumni, family and friends, the college is able to offer the exceptional experiences that make it stand out as one of the best undergraduate engineering programs in the nation.

Investing in Faculty Excellence

New faculty fellowships are empowering deeper, future-focused research. The Xin Faculty Fellowship in Computer Science & Engineering was created in 2025 through a gift from **Xin Xu '15**. Awarded to computer science & engineering professors Brian King and Alan Marchiori P'28, the fellowship will support their research, teaching and professional development.

Expanding Horizons

Each year, Bucknell engineers have opportunities to attend industry conferences where they present research and build their networks. With support from donor funding, approximately 200 students traveled to 30 destinations in the 2024-25 academic year, including to the American Institute of Chemical Engineers Annual Meeting in San Diego, the Biomedical Engineering Society Annual Meeting in Baltimore, the Grand Challenges Scholars Program Annual Meeting in Raleigh, N.C., and the Society of Women Engineers Conference and National Society of Black Engineers Annual Convention, both in Chicago.

Financial Aid

79% of students received Bucknell aid (Class of 2029) (need-based, merit or a combination of both)

88% of students received any aid (Class of 2029) (including grants, scholarships, loans and outside aid)

\$22,936 average federal student loan debt for the Class of 2024 among those who borrowed (compared to about \$30K nationally)

Funds Raised: Fiscal Year 2025

Gifts	\$905,620
Matching gifts	\$15,170
Planned gifts	\$150,000
Pledges	\$507,327
Total	\$1,578,117



The future of engineering is bold, ethical and creative, and it starts right here.



The continued excellence of the College of Engineering depends upon the meaningful generosity of donors. Join us in supporting our most impactful funding priorities:

- The Engineering Fund
- Engineering Merit Scholars Program
- BEAA Transformative Engineering Education Fund
- Engineering Success Alliance Program Endowment
- Engineering Experiential Learning Fund

Give at GIVE.BUCKNELL.EDU/ENGINEERING

Engineered for Success

Bucknell's College of Engineering prepares students to lead, innovate and thrive in a rapidly changing world. Through immersive learning experiences, career readiness programs and a strong alumni network, graduates enter the workforce ready to make an immediate impact.

Class of 2024 Outcomes

Nine months after graduation, the Center for Career Advancement surveyed engineers in the Class of 2024 to learn about their success.

94%

EMPLOYED, IN GRADUATE SCHOOL OR VOLUNTEERING

\$79,997

AVERAGE STARTING SALARY

Average Starting Salary by Major

\$90,764

BIOMEDICAL ENGINEERING

\$79,316

CHEMICAL ENGINEERING

\$75,445CIVIL ENGINEERING

\$65,750

COMPUTER ENGINEERING

\$104,250

COMPUTER SCIENCE & ENGINEERING

\$79,429

ELECTRICAL ENGINEERING

\$68,270

ENVIRONMENTAL ENGINEERING

\$76,799

MECHANICAL ENGINEERING

College Stats

Academic Year 2025-26

721*

Total full-time Undergraduate Enrollment

94%*

First-year retention rate

87%*

Six-year graduation rate

84%*

Four-year graduation rate

Class of 2029

895 [*]	210 *	70%	24%
Admitted	Enrolled	Male	Students
27.6%	23.5%	30%	of color
Admit Rate	Enroll Rate	Female	*As of August 2025

22 countries and 21 U.S. states represented

2026 Rankings**

U.S. News & World Report recognizes Bucknell's College of Engineering as a leader among undergraduate programs.*

0 Overall Rank

No. 3 Civil Engineering

No. 3 Mechanical Engineering

No. 3 Electrical Engineering

No. 4 Computer Engineering

*Among schools not offering doctorate degrees

** Not all majors are ranked individually by U.S. News & World Report. Some of Bucknell's engineering disciplines are not evaluated and therefore are not reflected in these rankings

BUCKNELL ENGINEERING ALUMNI ASSOCIATION BOARD

Jayne Beckmann '14, chemical engineering (Executive Committee Member; Alumni Engagement Committee Chair)

Tess Bilski '24, chemical engineering

Monica Brzozowski '18, mechanical engineering

Anne Meehan Cochran '02, civil engineering Shane Cohen '06, M'11, mechanical

engineering and studio art

Laura Cook '11, M'11, chemical engineering

Christina Garman '11, computer science and mathematics

Kat Wiley Gebreselassie '14, chemical engineering

Jeff Gum '78, electrical engineering

Kellen Haile '18, mechanical engineering (At-large Executive Committee Member)

Marc Henry '09, M'10, chemical engineering (Executive Committee Member; President-elect)

Nancy Ingabire Abayo '19, civil engineering and geology

Rob Jerman '78, chemical engineering

Jerry Jurick '84, mechanical engineering

Rick Kleinert '74, electrical engineering

Joe LaBarca '76, P'07, chemical engineering

Michelle Lesh '00, mechanical engineering

Sandra Madanat '21, biomedical engineering and management for engineers

Anthony Mariniello '90, P'25, chemical engineering (Executive Committee Member; President)

Ken McCauley '78, chemical engineering **Meredith Menzel Jones '13**, civil engineering and anthropology

David Metcalf '77, civil engineering **Matt Mosquera '14**, mechanical engineering **Darryl Novak '63**, mechanical engineering

Winnie Okello '10, civil engineering (Executive Committee Member; Communications Committee Chair)

Brian Picarillo '18, mechanical engineering

Helen Reetz '78, civil engineering (Executive Committee Member; Membership & Nominations Committee Chair)

Jeff Rockwell '07, computer science (Executive Committee Member; Student Engagement Committee Co-chair)

Christa Rotolo '11, civil engineering and management for engineers

Amanda Shapiro '14, chemical engineering

Andrew Solomon '12, mechanical engineering

Erin Threet '06, civil engineering (At-large Executive Committee Member)

Aditi Vijayvergia '21, M'23, electrical engineering

Ezra Yarnell '98, M'00, civil engineering



Bucknell | College of Engineering

