The School of Engineering, under the umbrella of New Jersey’s largest research university, is a leader in pioneering technology innovations and research developments that solve pressing social and industrial challenges while improving the quality of life for a global community.

A number of current research efforts are dedicated to doing just that by devising a tool to aid virologists’ fight against COVID-19; developing robotics that benefit society; advancing spinal cord research with new discoveries; launching a smart city test-bed in New Brunswick; and helping New Jersey deliver cost-efficient offshore energy.
OutFront

New Technique that Tracks Viral Mutations Could Help Defeat COVID-19

Materials science and engineering associate professor Laura Fabris has developed a novel technique that identifies and measures viral RNA in individual living cells—and also detects the small changes in RNA sequences that might give viruses a winning edge. This enhanced understanding of how single cells mutate could help speed the development of successful vaccines and therapies.

While her research has focused on using surface enhanced Ramen Spectroscopy (SERS) to detect Influenza A viral RNA and its mutations in living cells, the technique could be applied to any number of viruses—including SARS-CoV-2, the virus responsible for COVID-19.

Fabris’ efforts have benefited from her share of a $5.2 million Defense Advanced Research Projects Agency (DARPA) grant funding the multi-disciplinary INTERferring and Co-Evolving Prevention and Therapy (INTERCEPT) program grant that’s in its final year.

“The DARPA INTERCEPT program has made a big difference for us. INTERCEPT seeks to develop new vaccines and treatments based not on traditional routes, but on using viral RNA to fight itself,” she explains. “Our role has been supportive—to provide imaging tools such as SERS that make it possible to look at what happens inside a single cell as it replicates.”

Fabris is eager to aid virologists’ diagnostics, by beginning work on identifying regions of the COVID-19 genome to target with SERS probes.

“With the pandemic, we’re in an emergency mode, which means there’s a need to speed up. Accuracy is one of the biggest issues raised when moving too fast, and low-cost antigen methods for detection have let us down. We can contribute to the fight against COVID-19 by providing new and rigorous assays based on SERS,” she says.

Visit https://go.rutgers.edu/5f1efwo3
Developing Robotic Systems to Work for People and Improve Their Lives

Kristin Dana, a professor in the Department of Electrical and Computer Engineering, has received a $3 million, five-year National Science Foundation Research Traineeship grant for her “SOCRATES: Socially Cognizant Robotics for a Technology Enhanced Society” project.

“I’ve thought for some time that robotics is falling short in helping people in their everyday life and work,” Dana says.

As PI, she is collaborating with a cross-disciplinary team from across Rutgers to correct this deficit by training socially cognizant roboticists who are mindful of both technology and social sciences. “People think robots will replace them. In fact, what we need are robotic devices to work for people and help make their lives better. Robots are generally terrible at solving problems, but they can free humans from mundane tasks to do more of what humans do best.”

By integrating technology with social and behavioral sciences, SOCRATES aims to develop and implement an innovative, transformative approach to STEM graduate education training. The team will create a new, interdisciplinary curriculum for robotics specialization that focuses on technology, cognitive science, and policy.

The participants will be trained in the technology available for building and controlling robots; collecting and learning from large data sets; designing socially cognizant systems; and planning for a positive societal impact while mitigating unintended consequences.

“We plan to do experiments using our Rutgers Robotics Live Lab with key application domains like strength and mobility, recycling and trash collection, food preparation, and smart buildings,” Dana said.

The long-range goal of SOCRATES is to grow a community of researchers able to apply an understanding of social structures and processes to the development of robotics systems that benefit both individuals and society as a whole.
OutFront

BME Professors are Advancing Exciting Spinal Cord Research

Ten years ago, Rutgers football star Eric LeGrand suffered a spinal cord injury (SCI) during a game at MetLife Stadium. Since then, he has exceeded expectations for his recovery and rehabilitation to become a noted motivational speaker, entrepreneur, sports analyst, philanthropist, and author. He is also a source of inspiration for Department of Biomedical Engineering (BME) faculty and students who are exploring innovative ways to treat and repair SCIs.

“SCI is a devastating and life-altering form of trauma. For almost two decades, Rutgers BME faculty have been working to understand SCI and develop technology and approaches to help those who have suffered from it. Largely through research grants supported by the New Jersey Commission for Spinal Cord Research (NJCSCR), we see great promise in engineered solutions to: regenerate the spinal cord through gene therapy; provide alternative function through brain-computer interfaces; and accelerate the healing of chronic wounds,” says BME chair and professor David Shreiber.

Shreiber—along with BME department colleagues Jeffrey Zahn, Martin Yarmush, and François Berthiaume—is among the faculty members whose research in the above-mentioned areas has been funded by NJCSCR.

“SCI affects every aspect of a patient’s life,” says BME associate professor Li Cai. “It exerts a significant economic, emotional, and physical toll on patients and their caregivers.”

While no existing treatments can reverse the paralysis resulting from SCI, in 2019 Cai’s lab discovered a potential gene therapy that may help thousands of SCI patients regain motor control.

“We’ve developed a novel experimental gene therapy that promotes the regeneration of neurons in the injured spinal cord, resulting in dramatic functional recovery in an animal model of SCI,” he explains. “This has the potential to become a treatment for SCI that enhances the spinal cord regeneration, attenuates scarring, and reestablishes the spinal cord circuitry essential for functional recovery.”

Much of Berthiaume’s research focuses on alleviating pressure—or bed—sores in SCI patients, which are common secondary complications of SCI.

Berthiaume has also been invited to submit a proposal for an “expansion award” from the Department of Defense, for additional funding supporting the development of new compounds able to increase blood vessel formation and blood flow when applied topically to pressure sores—and speed up and improve the healing of these wounds.

“This expansion proposal includes working with individuals who live with SCI. Rutgers’ alumnus Eric LeGrand is one of them,” he says.

BME senior design groups led by distinguished professor Noshir Langrana have worked with LeGrand to outfit a drone that he can control with his phone to help him retrieve fallen objects. They have also 3D-printed customized stylus holders to attach to LeGrand’s wheelchair to allow him to easily pick up and place back the stylus he controls with his mouth. This simple design has had a profound positive impact on LeGrand’s quality of life.
Governor Phil Murphy has made reclaiming New Jersey’s historical position as a capital of American innovation and invention a cornerstone of his “Stronger and Fairer” economic development agenda.

One aspect of his vision for the state’s future economy included creating a large-scale Innovation Hub that would build partnerships between the public sector, institutions of higher education, real estate developers, and entrepreneurial private sector leaders. The New Brunswick Innovation Hub, a project turning the city into a test bed for high-resolution mobility data-gathering, analysis, and sharing, will help implement autonomous vehicle systems in the future.

This 12-acre area in downtown New Brunswick is the only living laboratory comprising an extensive network of sensors and the computing infrastructure to process, analyze, and make use of vast amounts of mobility data.

Rutgers Engineering is helping to realize this vision through the broader research arenas of its Wireless Information Network Laboratory (WINLAB) and the Center for Advanced Infrastructure and Transportation (CAIT).

As director of CAIT, Ali Maher has been critical in strengthening relationships with key regional stakeholders such as New Jersey Transit and the Federal Highway Administration and for his expertise in leading the development of the New Brunswick Innovation Hub. As one of 10 Department of Transportation University Transportation Centers, CAIT is advancing state-of-the-art research in infrastructure engineering and transportation technology while also playing an important role in New Jersey’s infrastructure planning and developing the next generation of transportation professionals.

CAIT researchers plan to outfit the designated Innovation Hub with high-resolution digital and radar cameras, smart intersections and pavement markings, and other mobility data-gathering and data-exchange technologies that will facilitate vehicle-to-vehicle, vehicle-to-infrastructure, and other multimodal communications. Jing (Peter) Jin, associate professor of civil and environmental engineering, said there are two major components of smart mobility solutions: advanced driver assistance systems (ADAS) and automated driving systems (ADS). Mobility data analysis and sharing technologies will facilitate autonomous vehicle systems (VtoX), while creating safer environments for all road users, and optimizing public transit options.

For its part, WINLAB is leading a Cloud Enhanced Open Software (COSMOS) pilot deployment that will enable faculty and students to conduct a variety of experimental studies on 5G+ technologies and applications, including increasingly important AI-driven smart city and transportation applications that are areas of research strength at Rutgers. The availability of 5G/edge cloud infrastructure in the New Brunswick area is expected to lead to various new real-world trials in collaboration with cities and agencies in New Jersey. WINLAB and the COSMOS project is led by Dipankar Raychaudhuri, director and distinguished professor, and Ivan Seskar, who serves as chief technologist responsible for WINLAB’s technology strategy and experimental research programs.

WINLAB is also part of two Innovation Zones created by the Federal Communications Commission. These Innovation Zones, located in New York City and Salt Lake City, are city-scale test beds for advanced wireless communications and network research, including 5G networks.

The National Science Foundation’s Platform for Advanced Wireless Research (PAWR)—a $100 million public-private partnership to deploy and manage up to four city-scale testbeds—formally proposed these particular Innovation Zones to enable experimental exploration of a host of wireless devices and communication technologies and services. The goal is to revolutionize the nation’s wireless ecosystem, enhancing broadband connectivity, leveraging the emerging Internet of Things (IoT), and sustaining U.S. leadership and economic competitiveness.

In New York City, the Innovation Zone, located in West Harlem, is run jointly by Rutgers University, Columbia University, and New York University, in partnership with the City of New York.
OutFront
Bridging Big Data and Transformational Energy Technology

Innovative, cross-disciplinary research by School of Engineering assistant professors is bridging the power of big data and climate change technology. Through various research initiatives, they are working to help New Jersey meet ambitious goals for cost-efficient offshore energy production by 2035 that will both benefit consumers and create new jobs.

Mechanical and aerospace engineering professors Onur Bilgen and Laurent Burlion are leading one of 13 teams funded by the U.S. Department of Energy’s Advanced Research Projects Agency-Energy (ARPA-E) $26 million investment in developing new technologies to advance floating offshore wind turbines (FOWTs) as a clean energy solution for the state.

According to Bilgen, while offshore wind turbines tend to be more efficient than their onshore counterparts, they cost considerably more. “Without accurate and complete modeling of a wind turbine with all of its interacting components, such as wind, water, soil, structural, electrical, and economic dynamics, we cannot design the best turbine for a given site, and we cannot decisively compare the efficiency metrics or costs of different designs.” The team is developing a software for designing efficient, cost-effective FOWTs using control co-design (CCD), which refers to the design and optimization of a system simultaneously with the system’s controller.

New Jersey—with its offshore coastal locations—is an ideal setting for this research. The team plans to use their software to design a FOWT that generates more electricity while using fewer materials to manufacture it, and while reducing its maintenance and operational costs.

At the same time, industrial and systems engineering professor Aziz Ezzat’s Renewables and Industrial Analytics (RIA) research group is bringing wind energy analytics up to speed by establishing collaborations with local industry partners and addressing the needs of the wind energy sector through an amalgam of data science, meteorology, and engineering.

Since 2019, civil and environmental engineering professor Roger Wang’s Hydro-Environment Informatics Research Lab (WHIRLab) has been developing numerical models to connect big data and decision-making in civil and environmental engineering systems. In addition to optimizing FOWT planning and operations, funded projects are creating tools to help New Jersey transportation planners enhance climate resistance and analyze trends in sea-level rise and coastal flooding resulting from climate change.
Grants and awards

Adam Gormley, an expert in nanobiomaterials and an assistant professor of biomedical engineering, recently received a $2 million award from the National Institutes of Health to study synthetic ligand multivalency using robotics plus machine learning to precisely program nano-bio interfaces.

Melike Baykal-Gürsoy, an associate professor of industrial and systems engineering, was awarded a $325,000 grant from the National Science Foundation for her project developing new game theory models and immersive simulations to aid emergency management agencies in fighting terrorist attacks.

Industrial and systems engineering assistant professor Wiehong “Grace” Guo is a member of a team that received more than $300,000 from the National Science Foundation for a project that will benefit the nation’s economy by studying the operations of mobile manufacturing facilities to develop a framework for supply chain network design and assembly planning.

Mehdi Javanmard, an associate professor of electrical and computer engineering, received a $500,000 Defense Advanced Research Projects Agency (DARPA) Young Faculty Award (YFA). Javanmard’s lab-on-a-microparticle project will make a new type of wirelessly powered tiny sensor able to map and monitor markers and various molecules in tissues and wounds.

Mechanical and aerospace engineering assistant professors Howon Lee and Rajiv Malhotra received a $4.9 million National Science Foundation Civil, Mechanical, and Manufacturing Innovation (CMMI) award for research in additive manufacturing of electrical circuits for multifunctional 3D components.

The National Institutes of Health has awarded chemical and biochemical engineering professor Charles Roth $420,025 to develop aerosolized nanomedicines that can penetrate mucus and biofilms in the lungs of cystic fibrosis patients for improved delivery and antibiotic efficacy.

Electrical and computer engineering assistant professor Bo Yuan received a $1.2 million National Science Foundation collaborative award to advance efficient on-device inference and learning for deep neural networks (DNNs), achieving stronger data privacy, less response time, and relaxed data transmission burden.

Mechanical and aerospace engineering professor Qingze Zou received approximately an $800,000 National Science Foundation grant to develop a sensing platform to achieve rapid, broadband nanomechanical mapping of live cells. The collaborative project includes Rutgers’ Waksman Institute of Microbiology and the Department of Biological Science, Rutgers-Newark.
As Dragos Maciuca tells it, being an early member of the Rutgers Formula Racing (RFR) team was a formative experience. “On the technical side, my involvement in the club obviously confirmed my love for cars and resulted in a career in the automotive industry,” he recalls. “But on the softer side of things, it developed my leadership skills and created a network and group of friends that I still keep in touch with.”

While today Maciuca is the executive technical director of Ford Motor Company’s Research and Innovation Center in Palo Alto, California, his professional experience also includes stints with BMW and Nissan. His current role positions him as a link between Silicon Valley and the automotive industry. “It’s a link that’s highly relevant today when software is that much more critical to the automotive industry,” he explains. “Bringing all this new technology into cars is really exciting.”

Maciuca, who graduated in 1992 with a degree in mechanical engineering and later earned an MBA and doctoral degree from UC Berkeley, was among a group of notable former School of Engineering RFR team members that included Anthony Musci ‘91 and David Faustino ‘01, scheduled to return to campus in late March for a special celebration of the 30th anniversary of Rutgers Formula Racing—an event that was cancelled due to the coronavirus pandemic.

**Extending Education Beyond the Classroom**

RFR was founded in 1989 by a group of engineering students eager to apply their classroom knowledge to designing, manufacturing, and racing a Formula race car as part of an annual collegiate student design competition sponsored by the Society of Automotive Engineers. The competition is known as Formula SAE or simply FSAE. From the beginning, RFR team members have gained critical skills in engineering, management, and leadership, with many going on to successful careers in various industries—including the automotive industry.

Musci, who was a founding member, president, and team leader of the club, recalls the inspiration behind the RFR SAE team. “We wanted to get real-world experience in designing, building, and managing projects,” he says. “Sure, we got to build a race car and enter competitions. But we also learned to work with people, learn our own limits, and get a well-rounded experience.”
“The fact that this happened at all is a big deal,” says Maciuca, who as a freshman was one of the first to join the new team, where he not only worked on the car’s suspension and fuel injection, but was also one of its drivers. “It took people like Anthony to push Rutgers and get bureaucratic approvals and permission to work in the middle of the night in a shop. That’s a big deal for someone 18 or 19 years old to accomplish.”

After his sophomore year, a summer internship at Ford gave Musci an opportunity to get the Big 3 company on board as an early RFR team sponsor. “We’d put together a budget of $8,500 and I was caught a little off guard when asked how much we needed in a follow-up phone call with Ford. I stated we needed at least $5,000 to move forward. This is where I screwed up: I should have asked for the full amount—Ford would have provided it. Instead, I left $3,500 on the table.” Nonetheless, the team was able to leverage Ford’s sponsorship and attract additional sponsors, who provided everything from direct financial support and mentoring by industry personnel to materials and/or services either donated at cost, at a discount, or freely donated.

Musci, who also holds an MBA from the University of Michigan Ross School of Business, is currently vice president of product development and technical services at Cahill Specialty Sales. Hired by Ford as a product design engineer after earning his mechanical and aerospace engineering degree from Rutgers, he soon was able to serve as team leader for the design and development of a new Aston Martin V12 engine, which has since powered countless models driven by consumers, racers, and even film’s James Bond. “Being part of bringing Aston Martin cars back since Carroll Shelby won Le Mans in 1959 was great,” he says.

Looking back, Musci believes that his RFR experience had less to do with career choices than with career preparedness. “The biggest thing it taught me was how to lead and manage very complex projects. A big part of FSAE is learning you can’t do everything—which is what managing a project is all about. It gave me the courage and confidence to take on big projects and recognize that if there are signs of trouble you can make a course correction before things get out of hand.”

For students today, Musci says that while being part of the RFR team will be tougher than they’d expect, “they’ll enjoy it and learn more than they ever thought possible.”

A Valuable Network

Faustino extols the practical benefits gained by team members. “It’s the practical application of your craft prior to going out into the real world,” he notes. “To be able to network with alumni and benefit from their experiences is incredibly valuable. Even if your grades slip a little bit, being on the team is still a high value proposition. I absolutely would not have been able to take the path I took without having started there.”

Faustino ultimately parlayed his experience in RFR working on chassis and suspension into a noteworthy career as lead race engineer for driver Will Power and the No.12 Verizon Team Penske Dallara/Chevrolet. In this role, he has produced 32 victories and 48 pole awards, including a win at the 2018 Indianapolis 500.

“Winning the Indy 500 was special for me,” Faustino says. “It was fairly surreal. It’s a passionate crowd and is a truly iconic American race. Winning took a team—not just me. But having participated in a number of the races, it was very nice to come through and win one.”

Faustino suggests that RFR team members interested in a similar career reach out at the get-go to alumni or anyone they might know in the industry. “It’s a niche industry, with a small number of people in the country and you really have to chase it. A lot of teams will take volunteers or interns—and once you have your foot in the door and people get to know you, it’s a lot easier.”

“Jump in with both feet,” Maciuca advises students interested in benefiting from hands-on experience that they might not get in the classroom. “If you think about how time-consuming it is, you’ll never do it. Perhaps for the first time as a young engineer you’ll learn what the systems approach means,” he notes. “In class, you focus on only one topic, but in putting the car together, you see how different engineering fields work together. The team’s a great place to make mistakes and learn from them. If you encounter this at work for the first time, it can be a nasty wake up.”

Musci has maintained involvement with RFR from the start. “I’m happy to help informally with anything from career connections to networking. I can’t say I know them all, but I do know well over 100 RFR alumni over the 30-year span,” says Musci, who along with fellow RFR alumni, had looked forward to connecting with current RFR team members at the 30th anniversary celebration.

For Maciuca, and other RFR alumni, the impact of being part of an RFR team is clear. “It’s part of who you are in the end,” he says.
WeRUUnited
EOF/EOP Summer Institute Creates Opportunity Remotely

Holistic advising, mentoring, and tutoring are Summer Institute hallmarks. “Our goals were to offer the same level of transitional support as we’ve offered in any other summer,” Brown explains. “This year, program mentors and counselors met with students daily. Group chats and conversations about everything from financial aid to coursework helped prepare them for the fall and provide them with the tools and resources they need to become independent learners and thinkers.”

Student participants agree. “Before I started the program, I was nervous about the future. The idea of learning remotely while pursuing a rigorous degree was unsettling,” recalls Michelle Forbes. “But I not only gained the resources to better prepare myself for my courses, but also a community of people who uplift and empower one another. I’m well prepared for what is yet to come.”

“The program gave me a head start to my fall semester and showed me that I’m capable of doing college level work,” says Sabrina Perez, who had worried about connecting with other students, professors, and advisors remotely. “I was able to make friendships and personal connections with everyone.”

“The program prepared me for the fall semester,” says Handell Quiros. “It not only showed the different workloads of each major, but also the different resources at my disposal come fall.”

Brown takes pride in the success of the virtual Summer Institute—and its students. “I’m beyond proud of what they accomplished in five weeks and of the system we were able to maintain remotely,” he says.

Yet Brown’s work is not done. “I don’t want to skip a beat with EOF services and support as first-year students join the larger EOF population in the fall. We want them to feel like a family and to have given them the ability to be successful at Rutgers.”

He adds, “We’re not just a summer program. We have at least four years to make them a part of this community—and we’ll go above and beyond to make sure they feel connected. While incoming students may get a little more attention at first, our programs, workshops, and services are all available remotely for the entire EOF/EOP community of more than 300 students.”
The School of Engineering welcomes five new faculty members who have joined the university over the past year. Hailing from several distinguished institutions, these new instructors bring extensive experience to Rutgers, having performed research in several exciting fields. We look forward to their continued growth and innovation as part of the Rutgers Engineering faculty.

Ahmed Aziz Ezzat, Ph.D.
Assistant Professor
Industrial and Systems Engineering
Ahmed Aziz Ezzat’s research interests focus on engineering-driven data science, renewable energy analytics and forecasting, and physics-informed statistical learning with applications in energy, manufacturing, and materials. At Rutgers he is leading the Renewables and Industrial Analytics research group to facilitate the large-scale integration of renewable energy (i.e. wind and solar) into power systems, in light of the uncertain and intermittent nature of renewable energy sources. He earned his doctoral degree in industrial and systems engineering from Texas A&M University.

Meiyin Liu, Ph.D.
Assistant Professor
Civil and Environmental Engineering
Meiyin Liu brings an interdisciplinary background to Rutgers where she will explore automation and robotics in construction and infrastructure engineering. Her research related to computer vision-based human motion capture and automated on-site ergonomic risk assessment for construction workers led her to pursue a master’s degree in computer engineering in order to be able to develop reliable technologies that can be deployed on real job sites. She had previously served as vice president of product management for start-up company Kinetica Labs. She earned her doctoral degree in civil engineering from the University of Michigan.

Ryan Sills, Ph.D.
Assistant Professor
Materials Science and Engineering
Ryan Sills’ research focuses on applying advanced computational tools to study the mechanical behaviors of materials, serving as lead of the Micromechanics of Deformation (mMOD) Research Group. As a staff member at Sandia National Laboratories prior to joining Rutgers, he partnered with experimentalists, materials scientists, microscopists, and theorists on research projects across a variety of applications while serving as PI for an R&D portfolio. He earned his doctoral degree in mechanical engineering from Stanford University.

Valerie Tutwiler, Ph.D.
Assistant Professor
Biomedical Engineering
Valerie Tutwiler will apply her talent and energy toward building an exciting research program studying blood, with a current focus on blood clot mechanics and physiology. She is interested in what makes blood stable and what causes a clot to bleed with a goal of developing better diagnostics for conditions such as thrombosis and bleeding from traumatic injury. She is the recipient of an NIH K99-R00 Pathway to Independence Award. She earned her doctoral degree in bioengineering and biomedical engineering from Drexel University.

Yuqian Zhang, Ph.D.
Assistant Professor
Electrical and Computer Engineering
Yuqian Zhang’s research leverages physical models in data driven computations, convex and nonconvex optimization, solving problems in computer vision, machine learning, and signal processing. She has been invited to participate in the Electrical Engineering and Computer Science (EECS) Rising Stars Workshop at Stanford University, and the Young Investigator Lecture Series at California Institute of Technology. She received her doctoral degree in electrical engineering from Columbia University.
WeRUnted
Alumnus’ Gift Creates
Elsayed A. Elsayed Endowed Scholarship

John Sharkey (BS ’79, MS ’90), describes himself as “a pay it forward kind of guy”—which is why he and his wife Christine have established the John and Christine Sharkey Elsayed A. Elsayed Endowed Scholarship with a $520,000 gift. The scholarship supports underrepresented industrial and systems engineering (ISE) students who exhibit financial need.

“I was able to have an unbelievable career because of my experience at Rutgers, which taught me a way to think about problems,” says Sharkey, who retired in 2018 as Vice President-Chief of Staff to the CEO of Corning Incorporated. “At Rutgers, I was able to learn to be an adult and get a great education—a perfect combination that helped make me who I am today. And one that industrial and systems engineering distinguished professor Elsayed A. Elsayed played a large part in. I couldn’t think of a more fitting way to honor someone I respect immensely and who is passionate about teaching young people.”

Elsayed A. Elsayed is a faculty member in the Department of Industrial and Systems Engineering, focusing on quality and reliability engineering.

For Elsayed, news of the scholarship was a total surprise. “I thought it should be named for the Sharkeys, not for me,” he says. “This is an honor, a humbling experience, and a highlight in my life.”

For Sharkey, while naming the scholarship in honor of Elsayed was important, equally important was the opportunity to support current and future deserving students. “The pandemic brought into sharp focus that the barriers to high quality education are even more significant for underrepresented and in-need students,” he explains. “There’s a strong correlation between income and academic performance; it can be hard to focus in the classroom when you’re worried about how to pay for school. We are hopeful this scholarship will help reduce some of this stress and financial hardship.”

Sharkey adds, “The power of the gift dwarfs its monetary cost. It can put kids on a path that allows them to achieve their dreams—and potentially change the arc of their career. And maybe one day, it will come full circle.”
At the Rutgers School of Engineering, student success is the top priority. “We make a commitment to our students when they first come to the school that we are there to help them succeed,” says associate dean Ilene Rosen. Yet for students facing an array of challenges posed by the COVID-19 pandemic, the Rutgers Engineering Student Emergency Fund is there to help.

From the start of the pandemic, the school recognized the need for additional funding and moved quickly to mobilize fundraising efforts. Since then, alumni and industry partners such as Phillips 66 have stepped up to help students in need—although the need is still great.

“Rutgers is an important partner to Phillips 66,” says Angela Rodriguez, the company’s university relations and recruiting director. “It is heartbreaking to hear of students trying to continue their education without having a place to live or enough food to eat. With this gift, we hope to take some of the burden off students so that they can focus on their education.”

“While we never could have predicted a global pandemic, we see this fund as a crucial way to help students meet some very basic needs—and in doing so, students are better situated to focus on schoolwork,” explains Rosen. “As the pandemic has escalated over time, we have begun to hear from growing numbers of students about how it has impacted them and their families.”

Within days of opening applications for Fund assistance, more than 130 students had applied, seeking relief for immediate and pressing needs. Currently, most students are not living on or near campus, but at home with their families where they are learning remotely. Some students, according to Rosen, have reported that since March one or both parents have lost jobs—and health insurance—and are accessing food banks for the first time.

“Some students reported taking two or more part-time jobs to help their families meet the most basic needs of housing, food, and health insurance, while others reported that family members have gotten sick with or died from the virus,” she says.

A laptop able to handle the type of programs needed for engineering coursework is a critical need for a few students, while others have had to share a laptop with family or friends, use their phones to attend virtual lectures, and use a public library to take exams. “Despite all of this going on, students stressed how much they wanted to stay in school,” Rosen says.

Rosen notes, “our colleagues in Engineering Computing Services were very helpful in pointing us in the direction of laptops that meet engineering students’ needs. We’ll be giving grants to cover the cost of these laptops to students who need them.”

Thanks in part to a generous $25,000 gift to the fund from Phillips 66, Rosen reports that her office hopes to offer students grants ranging from $1,500 to $4,500 to meet individual needs unrelated to computer access. The Engineering Governing Council, the school’s undergraduate student governing body is also looking to support this initiative.

The ability to meet ongoing student needs depends on the sustainability of available funds. To make a contribution to the Engineering Student Emergency Fund, visit https://go.rutgers.edu/h1g0t75v