



GALLOGLY  
COLLEGE OF ENGINEERING  
*The UNIVERSITY of OKLAHOMA*

# 22 Annual Report



**2022**

# Annual Report

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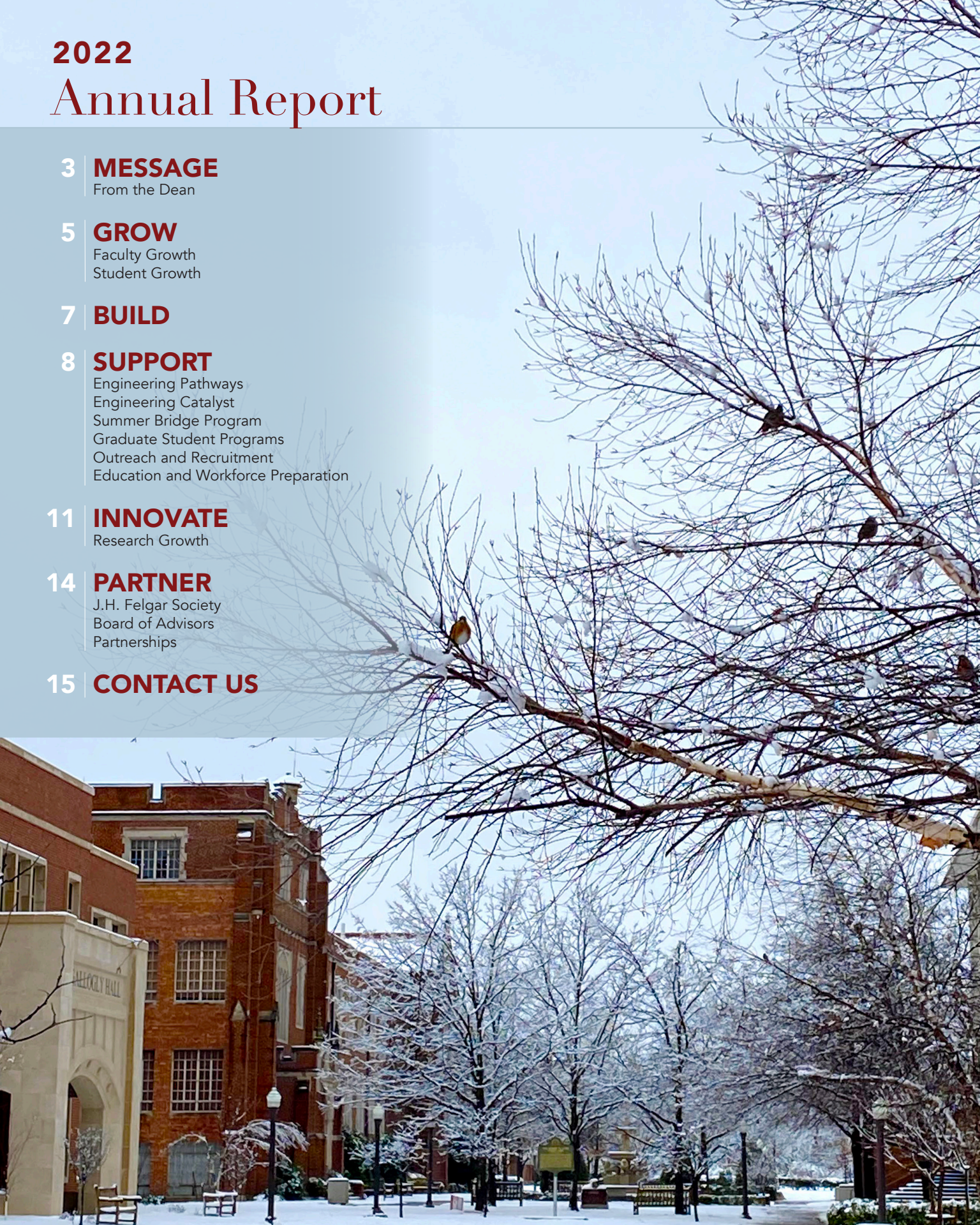
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# Message From the Dean

As I near my third year as dean, I am pleased to share the 2022 Annual Report for the OU Gallogly College of Engineering.

**GROW.** The State of Oklahoma's significant investment in engineering education has continued to pay off. This semester, we brought on 23 new faculty and instructors, bringing our total number to 175. Meanwhile, we have active searches for 20 more engineering faculty. Student enrollment also is on the upswing. We grew our incoming class size by 14%. Additionally, our online population is growing with several new online programs currently being offered and three more to be added in fall 2023, pending Regents' approval.

**INNOVATE.** With over 180 engineering research projects, we have increased research expenditures to record levels. Using a highly interdisciplinary approach and formation of research clusters, expenditures have increased 48% since fiscal year 2019. Here are a few of our research stories from this year: Reducing Carbon Emissions and Reducing Greenhouse Gas, Meeting Biopharmaceutical Workforce Needs, Transforming TBI Surgery, Creating a Power Grid of the Future, Detecting Hidden Cameras, and Building a Self-learning Thermal Home. More news can be found at [ou.edu/coe/news](http://ou.edu/coe/news).

**BUILD.** The college's growth has led to new investments in facilities for research and teaching. We have opened new learning and collaboration spaces focusing on the learning and retention of our first-year engineering students. We continue to improve our faculty labs. We revamped faculty and staff office spaces and have nearly completed a fume hood core facility in Devon Energy Hall B30 and the renovation of Gallogly Hall's fourth floor for biomedical engineering. We are in the process of adding a new research building for engineering, and we are collaborating with the OU Office of the Vice President for Research and Partnerships on a new advanced manufacturing research facility, as well as planning to build a new aerospace and defense research building. Additionally, OU recently received a \$3.5 million gift to support equipment expansion for the Stephenson School of Biomedical Engineering.

**CONNECT.** We all share the vision of improving engineering education. This year, we formally launched an innovative new program called Engineering Pathways. For this program, we hired eight new faculty members who focus on our first- and second-year engineering students.



OU Engineering continues to reach even more K-12 teachers and students throughout the state with family nights, middle school events and high school camps. We've hired more recruiting staff who have engaged with all 77 counties in Oklahoma and taken part in over 400 recruiting events at 130 schools. This year, our first-time enrollment grew 14%. Equally important, we have also increased retention to record levels.

**PARTNER.** This year, we hired an associate dean to strengthen our engagement with industry partners. We are expanding our already robust hiring partnerships to have a stronger emphasis on graduate student preparation and placement. Earlier this semester, we held a successful government and industry day, and a bioinformatics day to connect students, faculty and partners. We are building a database to connect graduate students with job opportunities.

There's no doubt that the engineering community is capable of amazing things. As I approach my third year at OU Engineering, I'm proud to be part of the community of engineering educators.

Thank you.

**John Klier, Dean and AT&T Chair**

Member of the National Academy of Engineering

Member of the National Academy of Inventors

**OU GALLOGLY COLLEGE OF ENGINEERING**  
**ACADEMIC LEADERSHIP, 2022**



**DEAN**  
**John Klier**



**DIRECTOR**  
**Ramkumar Parthasarathy**  
 School of Aerospace and Mechanical Engineering



**INTERIM DIRECTOR**  
**Dean Hougen**  
 School of Computer Science



**SENIOR ASSOCIATE DEAN**  
**Randa Shehab**  
 Co-director, Data Science and Analytics Program



**DIRECTOR**  
**Michael Detamore**  
 Stephenson School of Biomedical Engineering



**DIRECTOR**  
**J.R. Cruz**  
 School of Electrical and Computer Engineering



**ASSOCIATE DEAN**  
**Zahed Siddique**



**DIRECTOR**  
**Dimitrios Papavassiliou**  
 School of Chemical, Biological and Materials Engineering



**DIRECTOR**  
**Shivakumar Raman**  
 School of Industrial and Systems Engineering



**INTERIM ASSOCIATE DEAN FOR PARTNERSHIPS**  
**Sridhar Radhakrishnan**  
 Co-director, Data Science and Analytics Program



**DIRECTOR**  
**Randy Kolar**  
 School of Civil Engineering and Environmental Science



**DIRECTOR**  
**Michael Santos**  
 Engineering Physics Program

**OU EQUAL OPPORTUNITY STATEMENT**

The University of Oklahoma, in compliance with all applicable federal and state laws and regulations, does not discriminate on the basis of race, color, national origin, sex, sexual orientation, genetic information, gender identity, gender expression, age, religion, disability, political beliefs, or status as a veteran in any of its policies, practices, or procedures. This includes, but is not limited to: admissions, employment, financial aid, housing, services in educational programs or activities, or health care services that the University operates or provides.

**LAND ACKNOWLEDGMENT STATEMENT**

Long before the University of Oklahoma was established, the land on which the University now resides was the traditional home of the "Hasinai" Caddo Nation and "Kitikiti'sh" Wichita & Affiliated Tribes.

We acknowledge this territory once also served as a hunting ground, trade exchange point, and migration route for the Apache, Comanche, Kiowa and Osage nations.

Today, 39 tribal nations dwell in the state of Oklahoma as a result of settler and colonial policies that were designed to assimilate Native people.

The University of Oklahoma recognizes the historical connection our university has with its indigenous community. We acknowledge, honor and respect the diverse Indigenous peoples connected to this land. We fully recognize, support and advocate for the sovereign rights of all of Oklahoma's 39 tribal nations. This acknowledgment is aligned with our university's core value of creating a diverse and inclusive community. It is an institutional responsibility to recognize and acknowledge the people, culture and history that make up our entire OU Community.

**COST DISCLOSURE STATEMENT**

This publication, printed by OU Printing Services, is issued by the University of Oklahoma. 150 copies have been prepared and distributed at no cost to the taxpayers of the State of Oklahoma (or at no cost to the taxpayers of the State of Oklahoma).



# GROW

## FACULTY GROWTH

In 2021, the Oklahoma State Regents for Higher Education committed to developing the next generation of engineers in the state. With OU receiving state funding for fiscal year 2022, the investment in engineering education continues to pay off. The support has allowed the Gallogly College of Engineering to continue to recruit and retain faculty who are student centered and research driven. In fall 2022, the college welcomed 23 new faculty, bringing the number of tenure-track faculty to 162. Overall, OU Engineering now has a total of 175 tenure-track, research and instructional faculty. Meanwhile, 20 active searches for new faculty are taking place.



### GROWING COLLEGE

- Increased Faculty to 175
- Building and Renovating 10 Research Facilities
- **On Track for 190 Faculty by 2025**



Vivek Bajpai



Yaser Banad



Srikanth Bashetty



Hanping Ding



Kasun  
Gunasooriya



Tierney Harvey



Casey Haskins



Alisa Javadi



Javeed Kittur



Aikaterini Kyrioti



Brian  
McSkimming



Jude Okolie



Hanjong Paik



Dominique  
Pittenger



Allison Quiroga



Cesar Ruiz



Byeong-Min Roh



Diogo Sanchez



Sarah Sharif



Jakob Townsend



Kim Wolfenbarger



Shuozhi Xi



Sangpil Yoon



Presidential  
Professorships



Endowed Chairs



David Ross Boyd  
Distinguished  
Professorships



George Lynn  
Cross Research  
Professorships



Faculty Early Career  
Development Awards  
—  
National Science  
Foundation

## STUDENT GROWTH

Graduating engineers is an investment in education in and beyond the classroom, and the college's current number of enrolled students is a testament to OU Engineering's position as a top school in the region. While enrollment was somewhat impacted in 2020 and 2021 due to the pandemic, the college has made significant strides to improve enrollment numbers. For 2022, OU Engineering increased first-year undergraduate enrollment by nearly 100 compared to the year before, bringing the class size total to 703.

During 2022, OU Engineering continued to grow its graduate recruitment efforts. Over 780 engineering students were enrolled in a master's degree or doctorate degree program. OU Engineering offers 14 master of science degrees and doctoral degrees. As of fall 2022, OU Engineering offers five online graduate programs and an online doctorate in data science and analytics. To continue to attract new graduate students, OU Engineering launched several initiatives including a virtual graduate recruitment event in October.



### ACADEMIC DEGREE PURSUIT



### STUDENT DEMOGRAPHICS





# Build

Facilities to house faculty, staff and students are critical in keeping up with OU Engineering's growth. During 2022, the college's growth led to many new investments in renovated or new facilities. OU Engineering started 10 projects and are nearing completion on eight, with two about to start. Additionally, OU Engineering is raising funds for two large aspirational projects, including an advanced manufacturing research facility and an aerospace and defense research building, both supported by the OU Office of the Vice President for Research and Partnerships.

Here's a recap of several completed and in-progress projects.



Built in 1925, parts of **FELGAR HALL** underwent construction to create space for the new Engineering Pathways Program, which combines high-quality teaching with student-centered learning. Now operational, the McCasland Foundation Engineering Pathways Hub is on the first floor with the Engineering Pathways Studio on the second floor.

Built in 1966, OU Engineering upgraded parts of the **CARSON ENGINEERING CENTER**. The basement and first and fourth floors underwent renovations to offices and labs. Additionally, office space was created in Room 101, formerly a conference room, to hold new OU Engineering staff.



Carson Engineering Center



Core Fume Hood Facility for Research, DEH B30



Dedicated in 2010, **DEVON ENERGY HALL** underwent significant improvements, including office additions and open-lab reconfigurations. The five-story building now houses the Core Fume Hood Facility for Research in DEH B30.

Dedicated in 2010, the **EXXONMOBIL LAWRENCE G. RAWL ENGINEERING PRACTICE FACILITY** is a two-story, 41,000-square-foot interactive learning environment. New office construction and improvements to the Jerry Holmes Leadership Program area occurred in 2022.



Gallogly Hall, Floor 4 lab



Completed and opened to occupants in 2019, the fourth floor of **GALLOGLY HALL** underwent significant construction. Added to the 75,000-square-foot facility were eight new faculty offices, private research rooms, graduate study rooms and a conference room. New equipment includes an autoclave device, fume hoods, bottled gas cylinders, compressed air connections and refrigerated storage cabinets.

Located a few miles from OU Engineering is the **OU RESEARCH CAMPUS-NORTH**. OU Engineering operates several labs here and work was completed on two industrial buildings to update roofs, spouts and gutters.

# Support

## PATHWAY TO SUCCESS

The Engineering Pathways Program provides a connected environment for engineering students to develop their academic knowledge and professional skills.



**FRESHMAN**

### First-Year Engineering Experience

Strong foundation and social connections

Engineering Catalyst  
Math Catalyst



**SOPHOMORE**

Professional skills and responsibilities for all students

Research Catalyst  
Course-based research

Team projects and technical reports in discipline

Individual research with faculty



**JUNIOR**



**SENIOR**

Departmental capstones with industry partners



Enhanced academic preparation continues to be critical to student success and retention. In 2022, the Gallogly College of Engineering continued to expand and add new programs to better support engineering students.

## ENGINEERING PATHWAYS PROGRAM

In 2022, OU Engineering launched the Engineering Pathways Program to help address Oklahoma's growing need for engineers. College reports have anticipated a significant shortage of engineers over the next five years with as many as 1,000 engineers per year needed in Oklahoma. The state of Oklahoma's investment continues to improve engineering studies at state universities in June 2021.

Engineering Pathways combines high-quality teaching with student-centered learning and is housed in historic Felgar Hall. Now operational, the McCasland Foundation Engineering Pathways Hub on the first floor focuses on teaching students and provides modern facilities for collaboration. The hub accommodates faculty who are experts in engineering education or dedicated to improving learning experiences for engineering students.

Housed on the second floor of Felgar Hall, the Engineering Pathways Studio serves as an active-learning, team-based instructional facility. The classroom has a capacity for nearly 60 students and includes an adjoining project meeting space for class break-out groups or informal student meetings throughout the day.

The program employs staff experts in the areas of outreach, recruitment and retention. It is actively supported by 17 engineering students working as Sooner Engineering Education Center Scholars and college recruiters.



## ENGINEERING CATALYST PROGRAM

In 2022, OU Engineering continued to place a strong emphasis on helping highly motivated, less prepared, less resourced or less confident students pursue a career in engineering. Students who are not calculus ready are now receiving radical support through Engineering Pathways. One of the effort's key initiatives is

the Engineering Catalyst program, which provides student support, a research catalyst and a math catalyst. A pre-calculus cohort was launched in fall 2022. During a student's sophomore year, course-based research is emphasized.



## SUMMER BRIDGE PROGRAM

Established in 2008, the Summer Bridge program has been providing math readiness support to approximately 50 incoming freshman and transfer students each year. Summer Bridge is a four-week residential experience for students who are less prepared for the academic rigors of the engineering curriculum. Additionally, students become part of the engineering community through team-building exercises, attending math classes, tutoring and mentoring. The success of the program can be measured by the 2022 cohort as all students advanced at least one level in math. Students have the opportunity to advance from intermediate or college algebra to precalculus, trigonometry and/or analytic geometry.



**Brandon Abbott**  
Director  
Summer Bridge

## GRADUATE STUDENT PROGRAMS

During 2022, OU Engineering continued to grow its graduate recruitment efforts. Over 780 engineering students were enrolled in one of the college's 14 master's or doctoral degree programs; five are offered online and include a doctorate in data science and analytics. The college also launched several initiatives including a virtual graduate recruitment event in October.

## OUTREACH AND RECRUITMENT

OU Engineering's outreach and recruitment efforts are directed by Dalton Brasington. Year-round, he and his team introduce the excitement of engineering to Oklahoma's K-12 community. Outreach and recruitment include eight Sooner Engineering Education Center student employees who represent the diversity of seven schools and who assist in inspiring the next generation of students through on- and off-campus events.



**Dalton Brasington**  
Director  
Outreach and Recruitment

### OUTREACH BY THE NUMBERS

**5**

#### Big Events

Oklahoma City  
Innovation Week

Women in Science  
Conference

6th Annual Oklahoma  
City Public School  
District 8th Grade  
Career Expo

Bethany Elementary  
School STEAM Night

Rush Springs Public  
Schools STEM Night

**2**

in-school visits to local  
schools

**11**

Engineering Days  
in June featuring 11  
engineering disciplines.

An expanded day-camp  
for rising juniors and  
seniors.

**3**

Family Engineering  
Nights

**45+**

schools reached though  
outreach in 2022

**25**

elementary schools  
reached

**17**

middle schools reached

**1,400+**

students visiting campus

**300+**

students attended  
Engineering Open  
House

**200+**

middle school students  
were welcomed at Girls  
Learning and Applying  
Math and Science  
(GLAMS)

**75**

engineering student  
volunteers

OU Engineering's recruitment efforts build connections with students and promotes pathways to successful degree completion.

Recruitment efforts contributed to an increase of 100 first-year undergraduate students compared to 2021, bringing the first-year class size total to 703. Information sessions doubled to more than 80 and four additional weekly tours of the Engineering Quad were added. Transfer agreements between Rose State College in Midwest City, Oklahoma and Cameron University in Lawton were implemented.

#### RECRUITMENT BY THE NUMBERS

**66**

Large, or multi-school, college or career fairs

**39**

through our collaboration with the Great Plains Association for College Admission Counseling

**27**

through contacts (including career and technical centers)

**88**

information sessions

**250+**

schools reached through fairs and visits

**1,200+**

students visiting campus

**400+**

recruitment events attended

**14**

Events with the OU Office of Admissions and Recruitment

Evening with OU

Sowers Day

Scholars Day

National Merit dinners and others

**118**

Engineering quad tours



#### EDUCATION AND WORKFORCE PREPARATION

Enhancing workforce preparation is a key factor in producing more well-prepared engineers. Through expanded professional development offerings and online programs, OU Engineering continues to generate online, self-paced and in-person courses and programs to help professionals make an immediate impact on their careers.

In 2022, OU Engineering significantly grew its online presence. Eight online programs were offered with enrollment totaling over 200 students in fall 2022. Offerings included: master's degree programs in civil engineering, computer science, data science and analytics, hydrology and water security, and in industrial and systems engineering. Additionally, OU Engineering offers a doctorate in data science and analytics.

OU Engineering offers undergraduate certificates in data science and analytics, and engineering leadership. Additionally, OU Engineering offers one of the longest-running Lean and Six Sigma certification programs in the country, offering workshops to students and corporate partners since 2006.



# Innovate

The Gallogly College of Engineering is seeing exciting progress in its efforts to grow OU's position in groundbreaking research. The research landscape has progressed tremendously in the past year with a record-breaking increase in grant awards to OU Engineering. This increase plays a significant role in OU Engineering achieving top-tier research performance standards.

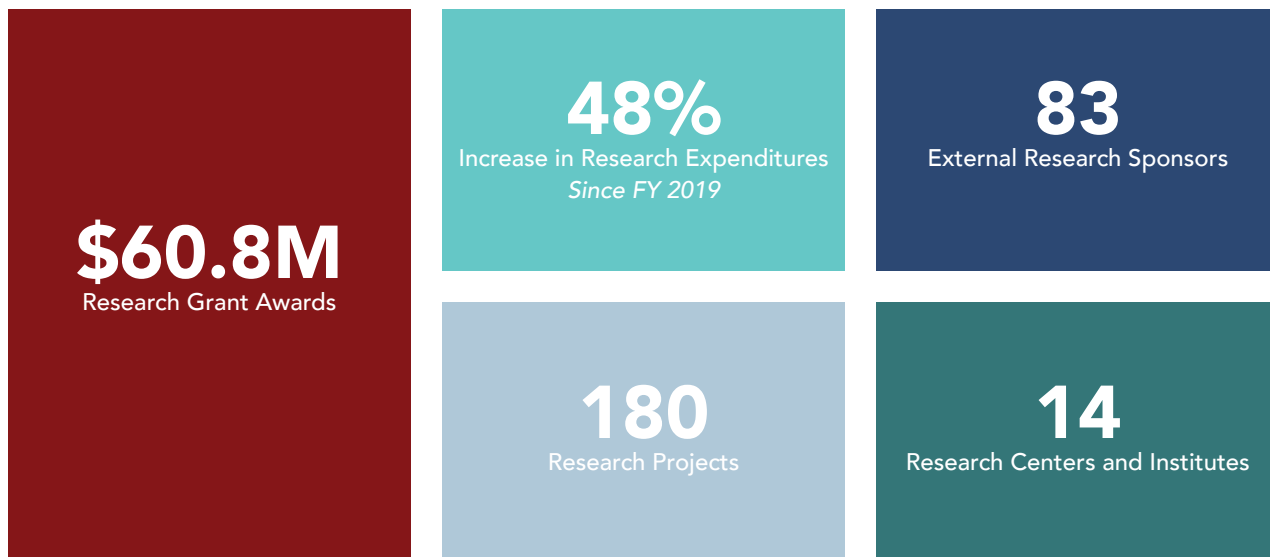
In 2022, OU Engineering faculty received \$60.8 million in research grant awards from 83 external research sponsors, including the federal government, industrial sponsors and foundations. OU Engineering builds on and integrates research at 14 multidisciplinary research centers and over 40 laboratory facilities. Centers include the Institute for Biomedical Engineering, Science and Technology, the Center for Restoration of Ecosystems and Watersheds, and the Advanced Radar Research Center.

OU Engineering added a key staff position to identify and promote strategic research initiatives. The work supports OU Engineering faculty and helps obtain resources to advance research. Additionally, OU Engineering provides research opportunities for its undergraduate and graduate students to work alongside faculty members in advanced laboratory settings and expand their classroom learning. In 2022, OU Engineering grew its GCoE Undergraduate Research Opportunities database that lists hundreds of student research opportunities.



Biomedical Engineering Professor Han Yuan examines MRI images.

## RESEARCH BY THE NUMBERS



## COLLABORATIVE RESEARCH

OU Engineering’s advancement in research requires collaboration both internally and externally. Many of the funded projects are part of the research clusters and initiatives plan OU Engineering launched in 2020. The initiative focuses on cross-disciplinary research in thematic areas that address issues with broad and future implications for the state, nation and world.

In 2022, OU Engineering launched a cross-disciplinary research initiative with broad and future implications in five research areas: materials and manufacturing, sensing technologies, medical technologies, infrastructure technologies, and data science and analytics. These five areas support key Oklahoma and University priority areas that focus on aerospace and defense, diversified energy and health care.

The research clusters and initiatives plan leverages collaborations with partner institutions, including Tinker Air Force Base, regional aerospace industry, OU Health Sciences Center and other institutions.

Ongoing hiring efforts continue to take place at OU Engineering. The college continues to leverage its hiring plan and financial support to secure faculty who can build and support research areas that support a Top 10 program. In 2022, the college hired faculty in immune-engineering, medical imaging, advanced manufacturing, data science and analytics, energy management, water and transportation.

In 2022, research expenditures for OU Engineering achieved record levels. OU Engineering faculty received \$60.8 million in research grant awards – from 83 external research sponsors, including the federal government, industrial sponsors and foundations. Significant funding sources include the National Science Foundation, the National Institutes of Health and the Department of Defense. The expenditures are a key contributor to OU Engineering’s impact on Oklahoma’s economy.



*Philani Hlanze (left), a Ph.D. student in mechanical engineering, and Jie Cai, an assistant professor in the School of Mechanical and Aerospace Engineering, shown in a testing facility that holds a psychrometric chamber*

## RESEARCH CLUSTERS AND INITIATIVES

CLUSTERS	INITIATIVES
<b>Materials and Manufacturing</b>	Digital Advanced Manufacturing
	Polymers and Coatings
<b>Sensing Technologies</b>	Radar
	Quantum
<b>Medical Technologies</b>	Medical Imaging
	Immuno-engineering
	Bio-manufacturing
<b>Infrastructure Technologies</b>	Water
	Transportation
	Energy
<b>Data Science and Analytics</b>	



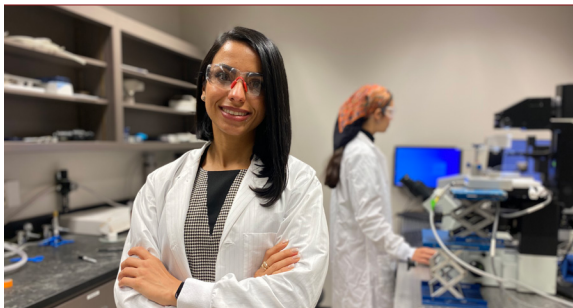
OU Engineering is laser focused on enhancing cross-disciplinary research initiatives that will address challenges and issues with broad and future implications. It is OU Engineering’s goal to double research productivity, particularly in strategic growth areas of health care, computing, energy and water. Below, a few research stories from 2022 that help improve the quality of life and stimulate economic development for our state, region, nation and world.



Yuan Yang, Stephenson School of Biomedical Engineering, has received nearly \$2 million in funding from the National Institutes of Health and the American Heart Association to examine the impact of strokes and the movement impairments suffered.



Qinggong Tang, Stephenson School of Biomedical Engineering, is the OU lead for a four-year study, funded by a \$2.5 million National Institutes of Health R01 grant from the National Institute of Diabetes and Digestive and Kidney Diseases.



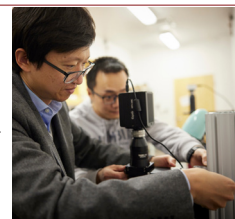
Sepideh Razavi, School of Chemical, Biological and Materials Engineering, explored the importance of droplet wetting—how drops of fluids bead up or spread out when they come in contact with a surface. The research is funded by a National Science Foundation Faculty Early Career Development (CAREER) award for her project titled “Decoding the dynamics of complex fluids near surfaces and interfaces.”



Li Song, School of Aerospace and Mechanical Engineering, built the BEEL House (Building Energy Efficiency Laboratory), located in a residential home near the Norman campus. It’s the only such research lab in the college.



Working in partnership with the Oklahoma City Air Logistics Complex, OU engineer John Antonio, School of Computer Science, and Ph.D. student Lacey Schley are leading a team that is studying how to improve routing platforms, such as those used to set the flight plans for aircraft.



OU received funding from the National Institutes of Health to establish the Oklahoma Center of Medical Imaging for Translational Cancer Research, a collaboration between the Gallogly College of Engineering and OU Health Stephenson Cancer Center. The award from the Centers of Biomedical Research Excellence (COBRE) program of the NIH is expected to provide more than \$11.3 million over five years.

# Partner

Donor support is essential to success in executing the college's strategic plan. From scholarships and fellowships to renovations of existing spaces and equipment purchases to accommodate faculty and student growth, the educational enterprise of the Gallogly College could not be realized without the philanthropy of alumni and friends.

## THE J.H. FELGAR SOCIETY

The J.H. Felgar Society connects donors to the college in substantive ways. From the annual on-campus signature event to key receptions throughout the nation, our Felgar Society members are empowering college leadership to lead with excellence during this unprecedented season of student, staff and faculty growth.

## BOARD OF ADVISORS

Consisting of approximately 32 active and 61 senior active members, the college boasts a robust Board of Advisors who meet twice a year. In addition to these meetings with college leadership, several working groups in the areas of external affairs, student affairs, and research and technology continue to move the college forward through meetings at regular intervals throughout the year.

## PARTNERSHIPS

OU Engineering continues to value partnerships with Oklahoma industry to foster reciprocity in research and workforce supply of engineering talent. Through events that include semi-annual symposiums with industry and government agencies, OU Engineering is building a pipeline to serve industry partners while advancing research utilizing the college's laboratories and research expertise.

## DONOR REPORT

CATEGORY	AMOUNT
Equipment	\$ 3,500,000
Felgar Society/ Renovations	2,393,330
Gallogly Hall Construction	619,000
Miscellaneous	433,750
Support to 7 Schools	2,470,000
Student Support	921,547
<b>TOTAL</b>	<b>\$ 10,337,627</b>

GIFT TYPE	AMOUNT
Cash/Pledges	\$ 7,813,877
Planned Gifts	\$ 2,523,750
<b>TOTAL</b>	<b>\$10,337,627</b>





# Contact Us



From left: Zahed Siddique, John Klier, Randa Shehab and Sridhar Radhakrishnan

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