UNIVERSITY OF ARKANSAS

College of Engineering 2017 Fact Book

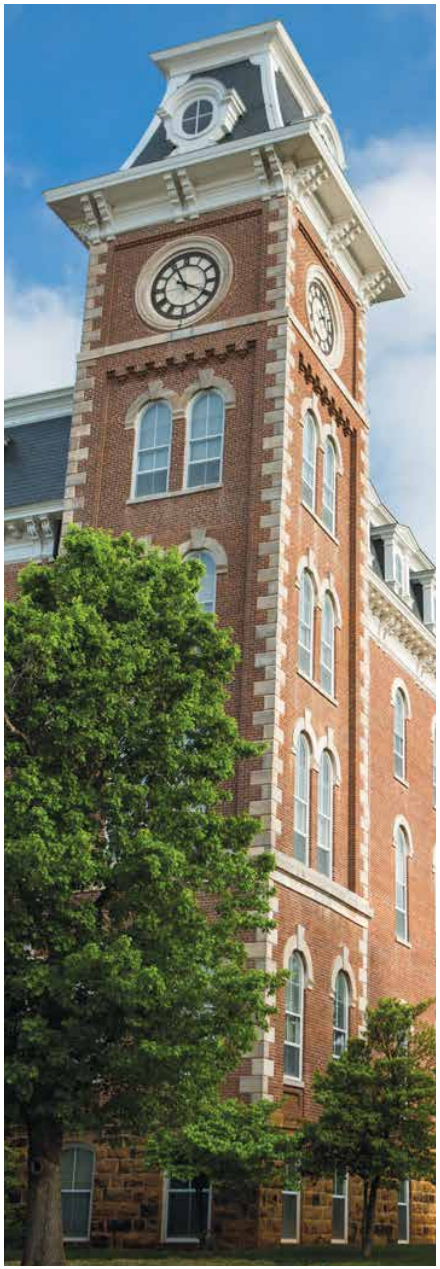
AS DEAN OF ENGINEERING, I am pleased to present the 2017 College of Engineering Fact Book. The data found in the following pages presents our progress towards fulfilling the objectives of our strategic plan. The information is organized according to the objectives, and in each section of the book, you will read stories of success specific to the objective being addressed.
This book shows our proud commitment to fulfilling our role as part of a land grant university. In its pages you can see where we have been, what progress we have made, and how we are working to prepare our students, faculty, staff and alumni for tomorrow.

John R. English
Dean, College of Engineering
Professor of Industrial Engineering
Irma F. and Raymond F. Giffels Endowed Chair in Engineering

UNIVERSITY OF ARKANSAS

College of Engineering 2017 Fact Book

Our stories. Our progress. Our future.

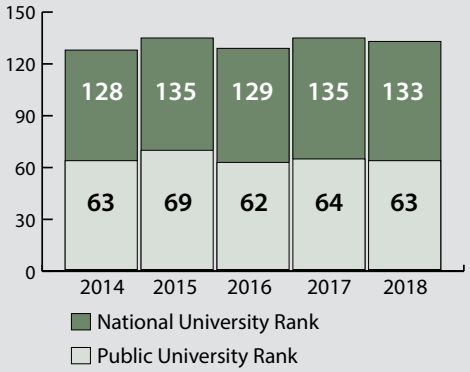


UNIVERSITY OF ARKANSAS

Fall 2017 Total Enrollment

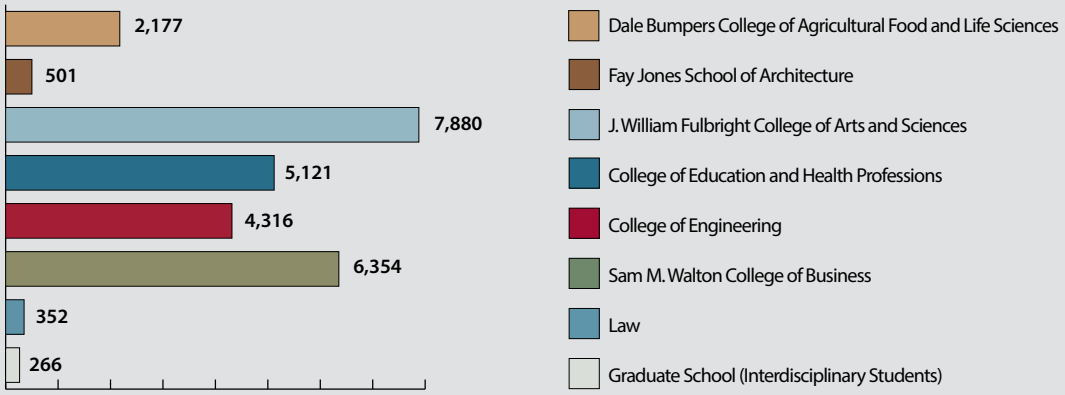
Undergraduate	**23,044**
Graduate	**4,161**
Law	**353**
Total Enrollment	**27,558**

University of Arkansas Rankings*

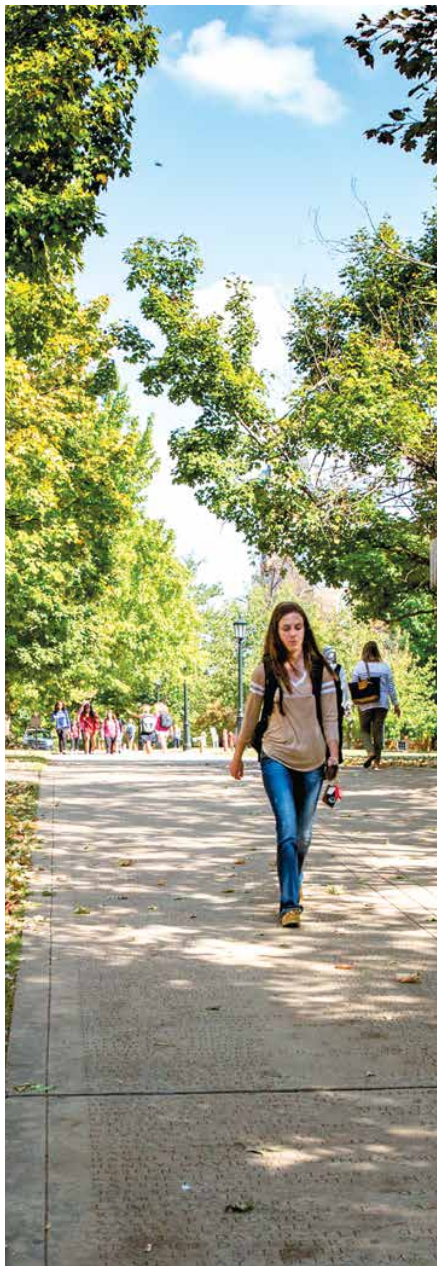


* Source: U.S. News and World Report

University of Arkansas Fall 2017 Enrollment *(Degree Seeking Only)*



Total Students



UNIVERSITY OF ARKANSAS | College of Engineering

2017 Enrollment Highlights

Undergraduate*	3,393
Graduate**	958
College of Engineering Total Enrollment	**4,351**

Total undergraduate enrollment is **up 2.5 percent** over 2016.

Since 2007, undergraduate enrollment has **more than doubled.**

We have **802 new freshmen** for 2017.

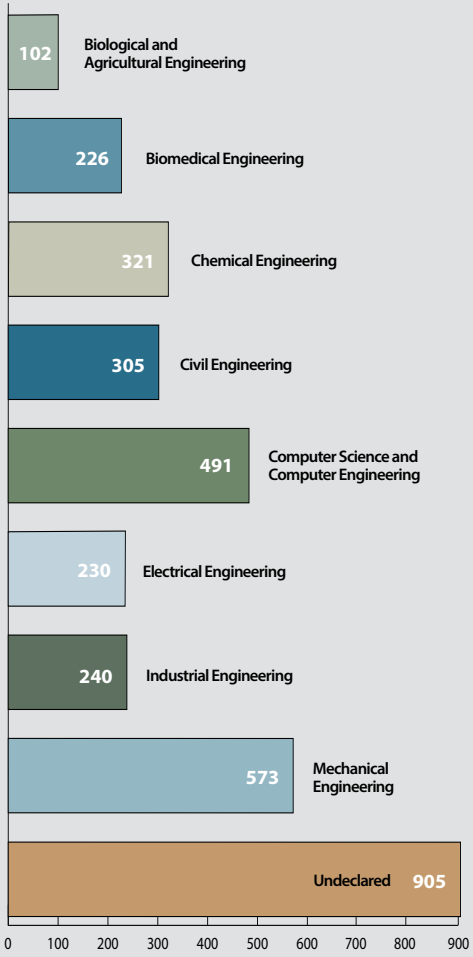
Our 2017 freshman class is **24 percent female.**

Underrepresented students—**female, minority and first generation college students**—make up **50.1 percent** of the freshman class.

* Degree seeking only

** Includes engineering students enrolled in interdisciplinary programs and distance education

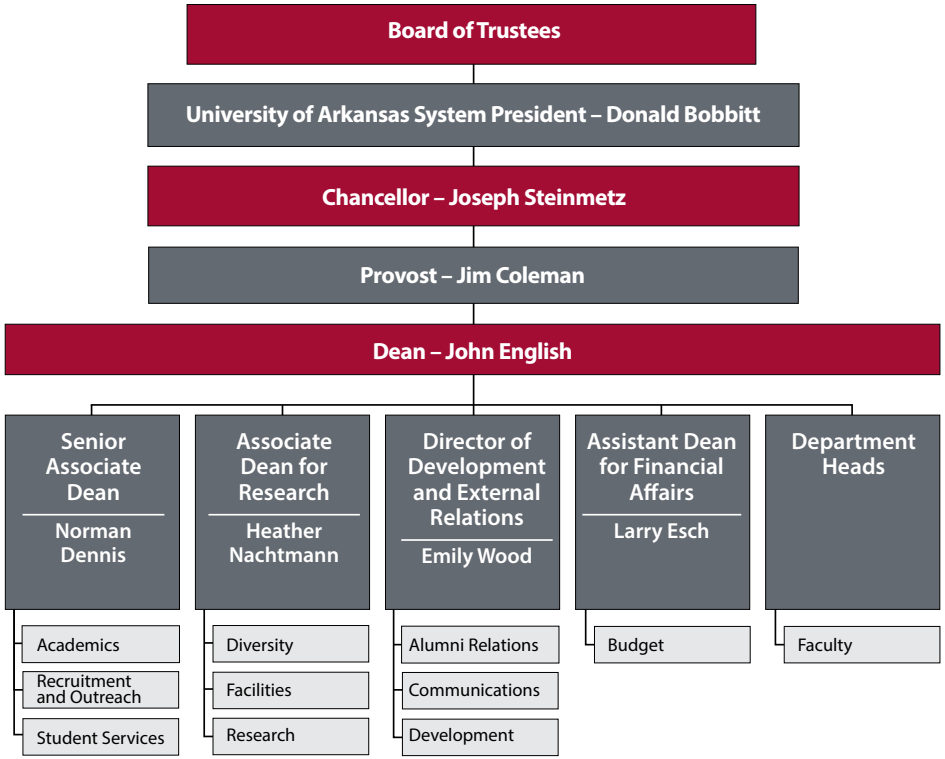
Fall 2017 Undergraduate Enrollment by Department*



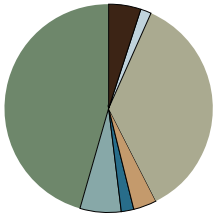
* Students in the Freshman Engineering Program are not included.

College of Engineering

Organization & Finances

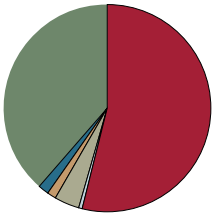


2017 Revenue (excluding gifts)



- State Appropriations & Tuition $24,090,402
- Distance Learning Revenues, Ft Smith, Service Centers, Conferences $3,362,663
- Research Incentive Funds $953,566
- Biological Engineering Teaching and Agricultural Experiment Station* $1,898,336
- Sponsored Research ** $19,057,463
- Sponsored Activities and Scholarships $900,368
- Student Equipment Fee Revenues (TELE-net) $2,689,449

2017 Expenditures (excluding gifts)



- Salary and Benefits $21,296,537
- Operating Expenditures $922,571
- Dept Restricted Fees/Misc $754,493
- Student Equipment Fees $2,137,758
- Scholarships $343,444
- Research*** $29,770,215

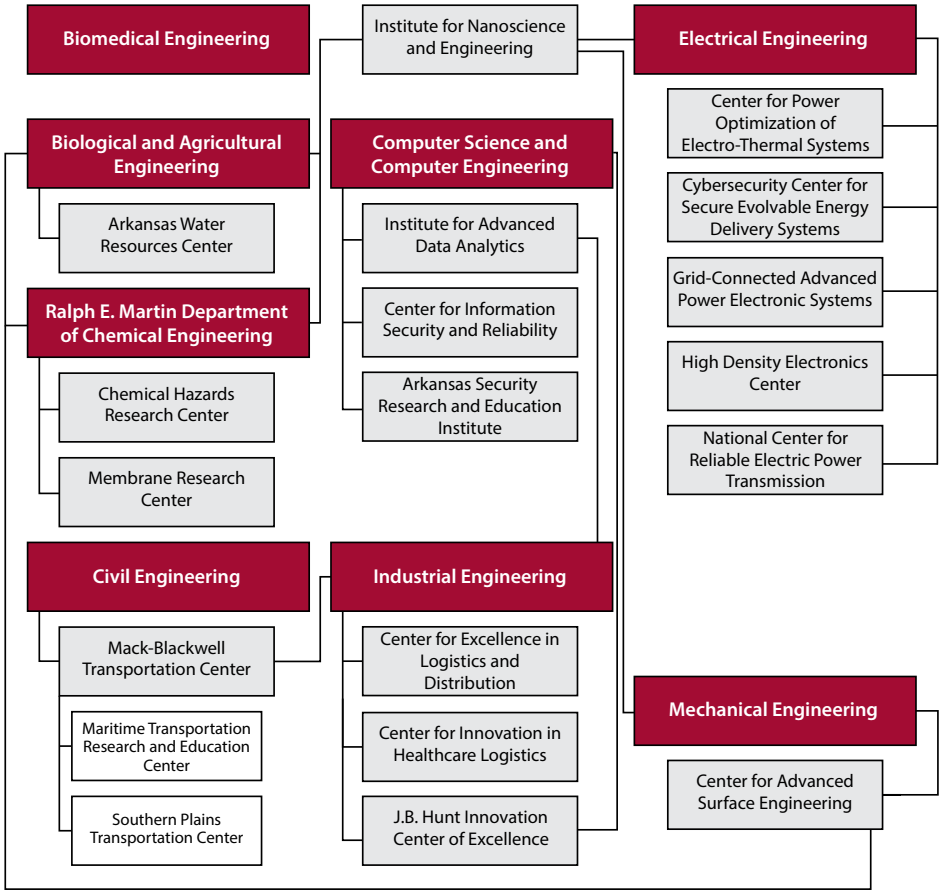
Total Revenue: $52,952,247
Total Expenditures: $55,225,019

For complete financial information, see Appendix page 36

* Cooperative Extension Service not included
** As reported to ASEE and USNWR
*** Reported and compiled by the U of A Research Accounting Office and submitted to the NSF

College of Engineering

Departments and Centers



College of Engineering

Strategic Plan

UNIVERSITY OF ARKANSAS

Vision

Pursue excellence in research, scholarship and education, ensuring personal and professional growth for future generations of engineering leaders who will stimulate prosperity for Arkansas, the nation and the world.

Strategic Goals

- Recruit and graduate diverse, high-quality students
- Increase number and diversity of faculty and staff
- Support, recognize and reward faculty and staff excellence
- Increase research proposals and funding
- Build research and development culture
- Cultivate relationships with alumni and corporate partners
- Plan for infrastructure growth

Balanced Growth Metrics

- 3,500 undergraduate students
- 1,000 master's students
- 350 doctoral students
- 135 tenured and tenure-track faculty members
- 65 clinical and research faculty members
- 180 staff members
- $300,000 in research expenditures per faculty member

Objectives and Metrics

Increase student quality and diversity	Provide student centered education	Recruit and retain high quality faculty and staff	Increase research productivity	Increase economic development	Increase alumni and corporate partnerships	Provide high quality infrastructure
• ACT and GRE quantitative scores • Career placement rate • Graduate student acceptance rate • Honors student completion rate • Student diversity	• Experiential learning participation • Freshman retention rate • Six year undergraduate graduation rate • Student-faculty ratios • Student semester credit hours per FTE • Undergraduate degrees awarded	• Faculty retention • National awards • Professional society leaders and fellows • National Academy of Engineering membership • Staff to faculty ratios • Faculty diversity	• Doctoral and master's degrees granted • New research grants received • Peer reviewed publications •Research proposals submitted • Research expenditures (total and per faculty)	• Invention disclosures • Industry research expenditures • Patents awarded • Startup companies	• Philanthropic giving • Endowed faculty positions • Endowed scholarships and fellowships • Percentage of alumni who give	• Academic space • Research space • Renovated space • Renovation investment

Preparing You for Your Tomorrow

Our stories

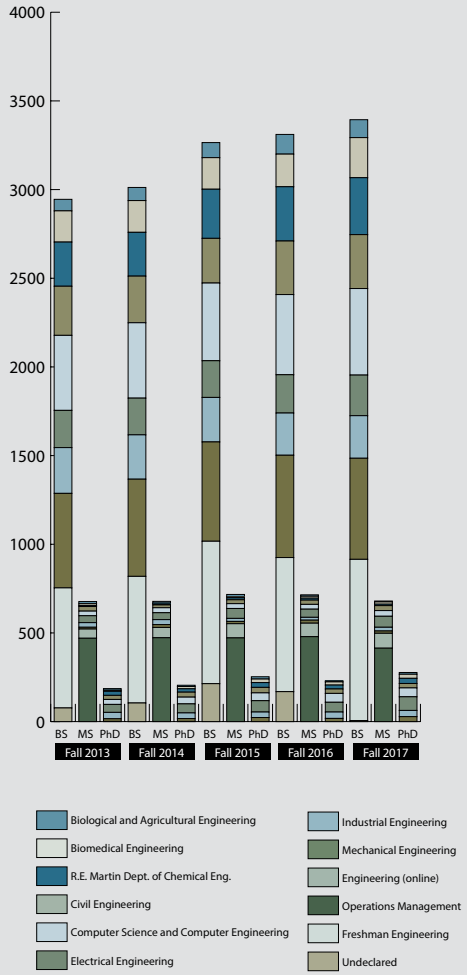
Danielle Neighbour, BSCE 2016
2016 College of Engineering Outstanding Senior

Danielle Neighbour wants to spend her career alleviating the global water crisis, and her experience at the College of Engineering has given her a great start. Her first trip abroad was an internship with Reach Beyond International in Ecuador. It was on this trip that she learned what it means to help communities struggling with water issues. Neighbour built on her experience with water quality issues on a service leadership study abroad trip to Vietnam. Neighbour has also studied abroad at the University of Barcelona in Spain, where she took classes in Spanish, participated in a language exchange partnership program, and made new friends from all over the world. At an internship at Burns and McDonnell in Kansas City, she also gained experience in consulting engineering.

Neighbour's global adventure hasn't ended since she graduated in December 2016. As a senior, she received both the Truman Scholarship and the Schwarzman Scholarship. Since graduating, she spent the spring semester getting more hands-on experience as a strategic initiatives intern with the water technology company Xylem Inc. in New York City.

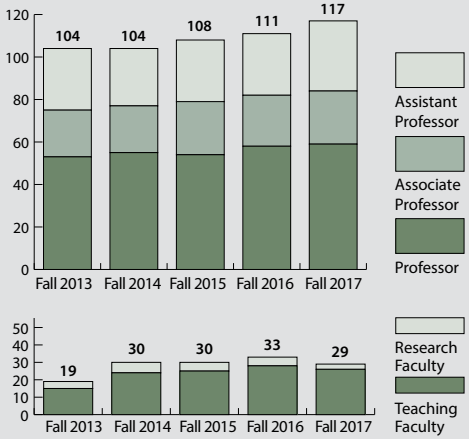
Balanced Growth — Our progress

Enrollment by Department*

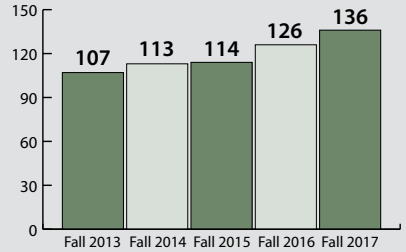


* Interdisciplinary students are included in the department of their faculty advisor.

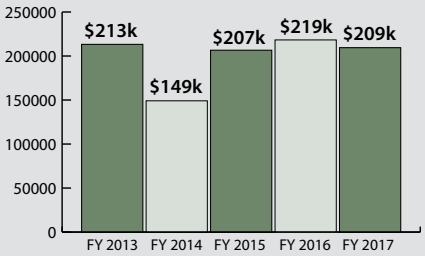
Faculty by Rank



Total Staff



Research Expenditures per Faculty



Our future

Balanced Growth Goals

- 3,500 undergraduate students
- 1,000 master's students
- 350 doctoral students
- 135 tenured and tenure-track faculty members
- 65 clinical and research faculty members
- 180 staff members
- $300,000 in research activity per faculty member

Our stories

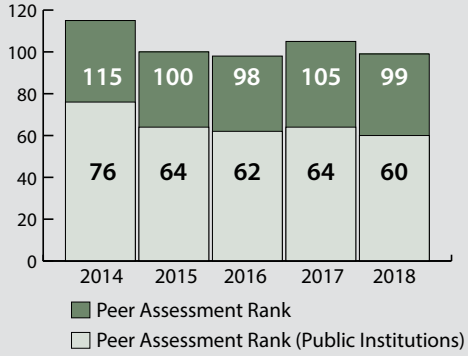
Humeyra Ulusoy-Erol
Doctoral Student, Chemical Engineering

Humeyra Ulusoy-Erol is conducting research on water quality and biofuels, and she is passionate about women's rights around the world. In her home country, Turkey, Ulusoy-Erol was the president of an organization devoted to empowering women as citizens. When she came to the U.S. to study, she continued to advocate for women's rights. Her involvement with this issue has led Ulusoy-Erol all the way to the United Nations, where she and some friends organized a panel called "Empowering Refugee Women as Entrepreneurs in American Economy" for the 61st session of the UN Commission on the Status of Women.

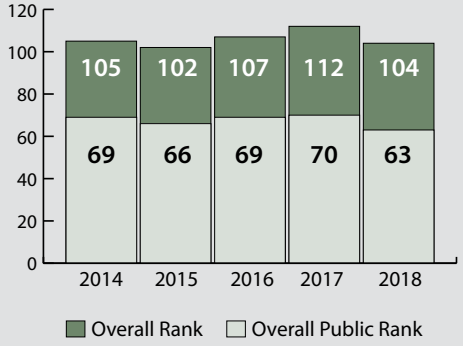
Ulusoy-Erol has also been selected to receive an AAUW International Doctoral Fellowship from the American Association of University Women. Founded in 1881, AAUW is one of the world's largest sources of funding for graduate women.

Balanced Growth — Our progress

U.S. News & World Report Undergraduate Ranking



U.S. News & World Report Graduate Ranking



U.S. News & World Report Undergraduate Peer Assessment Score

U.S. News & World Report Graduate Reputation Score

Our future

U.S. News & World Report How Rankings Are Measured

U.S. News and World Report, a popular source of university rankings, ranks both undergraduate and graduate programs.

For Ph.D. programs, it considers metrics related to the quality of students the college attracts and metrics related to graduates' achievements.

U.S. News also surveys deans, program directors, senior faculty and professionals who hire engineering graduates to establish peer and corporate recruiter assessment data. For its college undergraduate rankings, U.S. News uses only peer assessment data. The 2018 rankings are based on a two year average of data from 2015 and 2016.

Graduate Rankings Metrics:

Quality assessment:	
Peer assessment	25%
Corporate recruiter assessment	15%
Student Selectivity:	
Mean GRE quantitative score	6.75%
Graduate acceptance rate	3.25%
Faculty resources:	
Student-to-faculty ratio - Ph.D.	7.50%
Student-to-faculty ratio - M.S.	3.75%
Percent of faculty in the National Academy of Engineering	7.50%
Doctoral degrees awarded	6.25%
Research activity:	
Total research expenditures	15%
Average research expenditures per faculty member	10%

Look for this icon throughout the book. It indicates metrics that directly affect our *U.S. News* ranking.

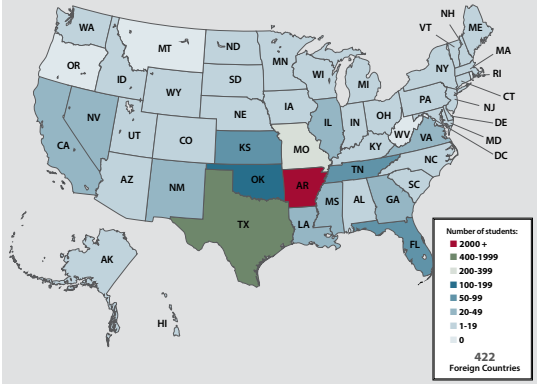
Our stories

Norman Dennis
Senior Associate Dean
University Professor of Civil Engineering

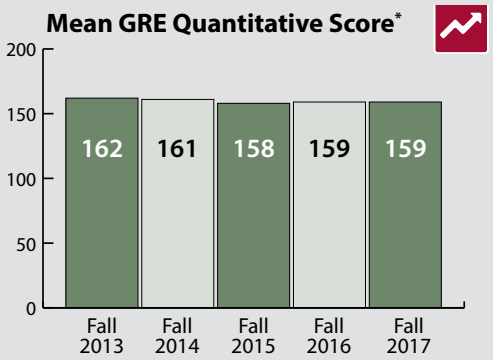
"In today's technology driven global economy, our students need to know how to combine engineering skills with creativity and innovation to come up with the next big ideas. That's why the College of Engineering is finding ways to nurture and encourage our students' drive to explore and invent. In the new Freshman Honors Innovation Experience, students make a plan to develop and commercialize a new product. We plan to build on the success of this program and integrate innovation throughout the engineering curriculum."

Increase student quality and diversity — Our progress

Our Students' Home States

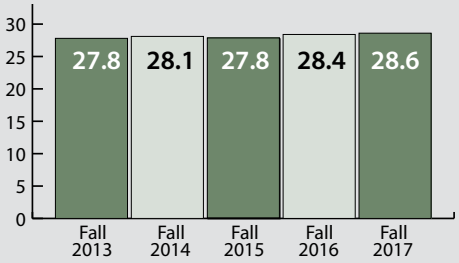


Mean GRE Quantitative Score*

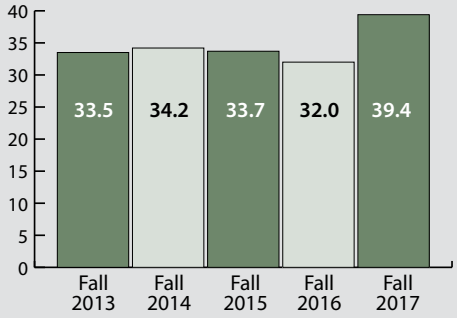


* Does not include distance students.

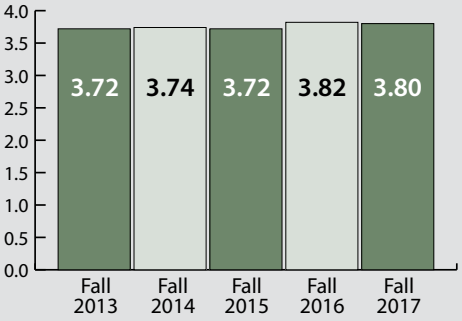
New Freshman ACT Average



Graduate Student Acceptance Rate



Mean High School GPA



Our future

Preparing for Tomorrow:

- We will continue our outreach to Arkansas K-12 schools with increasingly excellent STEM programming to interest young people in engineering careers and to enhance the number of students pursuing STEM disciplines.
- We are working to create more endowed scholarships to support engineering undergraduates who have financial need.
- We hope to establish more doctoral fellowship endowments to recruit graduate students and provide our faculty with excellent assistants in their research.
- We plan to increase scholarships for juniors and seniors who display exceptional leadership and academic qualities.

Our stories

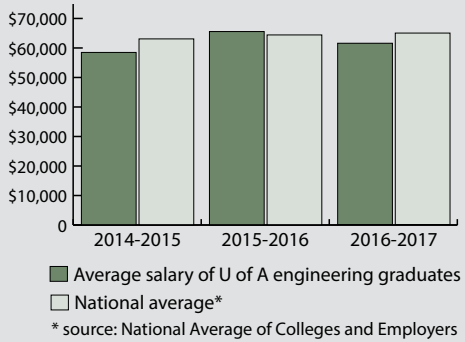
Keuna Porter
Chemical Engineering Student

"As a child, math and sciences were things that I easily understood. As I got older, I wanted to take my understanding of those subjects and make a difference in the world. That's how I chose to attend the University of Arkansas and became part of the Engineering Career Awareness Program in the College of Engineering.

ECAP, for me, is my family away from home. I am from a small town, so such a large university atmosphere could have easily become overwhelming. ECAP has helped me find my place here. Through the program I have met my closet friends, and been exposed to early opportunities to be involved in several organizations on campus through exposure, awareness, and networking."

Increase student quality and diversity — Our progress

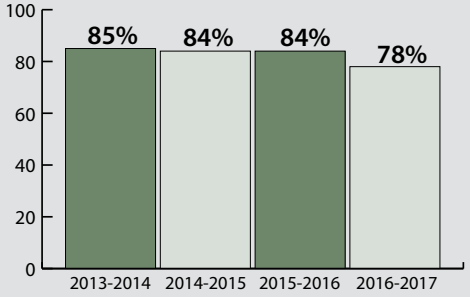
Engineering Graduate Starting Salaries: U of A and National Averages



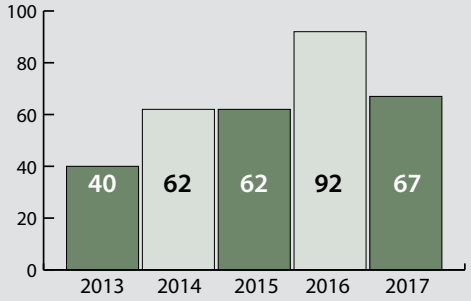
* source: National Average of Colleges and Employers

Engineering Graduate Placement Rate

(percentage of graduates employed or attending graduate school)



Number of Engineering Honors College Graduates



Fall 2017 Incoming Student Awards

Bodenhamer Fellows 1
Honors College Fellows..... 39
Chancellor Scholars 106

Recipients of Nationally Competitive Awards and Scholarships

	2013	2014	2015	2016	2017
National Science Foundation Graduate Research Fellowship	1	8	1	2	2
National Science Foundation Graduate Research Fellowship Honorable Mention	1	3	3	1	3
Goldwater Scholarship		1		1	1
Goldwater Honorable Mention			2	1	
Whitaker Fellowship		1			
NSF CyberCorps Scholarship for Service		1			
Udall Scholarship			1		
Truman Scholarship				1	
Gates Cambridge Scholarship				1	
Schwarzman Scholar					1

Our future

Preparing for Tomorrow:

- Every semester, our STEM Career Fair attracts over 100 employers and over 1,000 students. We also offer networking events and workshops around the event, so that students receive many opportunities to work on their resumes, practice their interview skills and connect with potential employers.
- With endowed funds for colloquia, we invite speakers to campus and create programs for visiting scholars and executives in residence at the university. This exposes our students and faculty to the emerging trends in engineering excellence.

Our stories

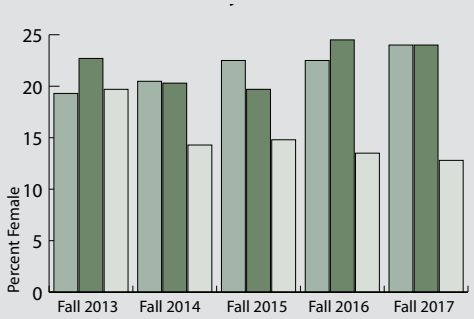
Orlando Aguirre-Martinez
Computer Science and Computer Engineering Student

"I primarily chose the University of Arkansas because of the Engineering Career Awareness Program. As part of ECAP, I attended a summer bridge program the summer before my freshman year where I got to meet the rest of my cohort. This allowed me to know 20 incoming engineers that I knew were taking some of the same classes. It was helpful to see some familiar faces on the first day.

Over time, I have found ECAP provides a network of people who become like family. I keep up with ECAP alumni, and there are many out there doing some amazing things with their careers!"

Increase student quality and diversity — Our progress

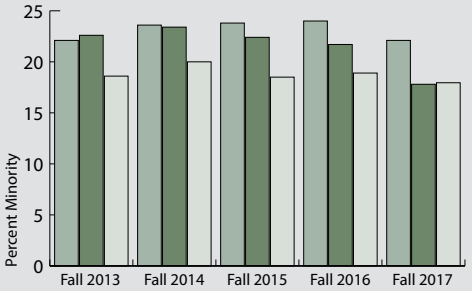
Gender Diversity



Undergraduate Students
Graduate Students*
Faculty

* Does not include distance education.

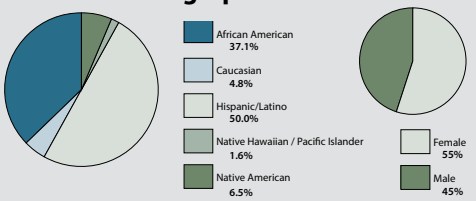
Ethnic Diversity



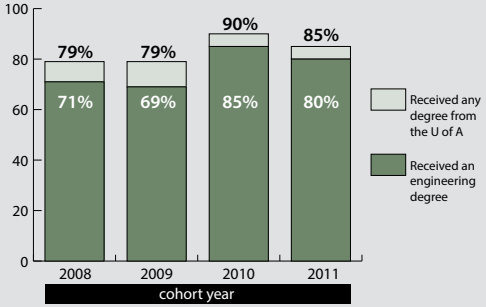
Undergraduate Students
Graduate Students*
Faculty

* Does not include distance or international students.

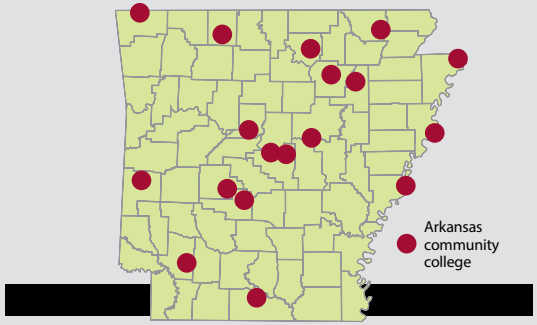
Engineering Career Awareness Program Student Demographics



Engineering Career Awareness Program Six Year Graduation Rate



STEM Preparation Program



We are easing students' transition from community colleges through the STEM Preparation Program. This program provides online science, engineering and math classes for students enrolled at an Arkansas community college. These classes count toward an associate's degree at the student's community college and a bachelor's degree in engineering, science or math at the University of Arkansas.

Our future

The Engineering Career Awareness Program is a recruitment and retention program that removes barriers for underrepresented students to earn engineering degrees.

Preparing for Tomorrow:

- Our Engineering Career Awareness Program (ECAP) has led to significant increases in students who are underrepresented in engineering. These include first generation college students, women and minorities.
- In order to maintain and expand on this success, we are pursuing significant financial backing for underrepresented students with financial need, so they have the means to attend the university and earn engineering degrees.

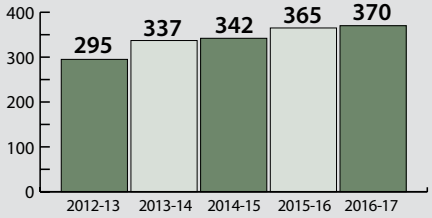
Our stories

Samia Ismail
2016 Freshman of the Year

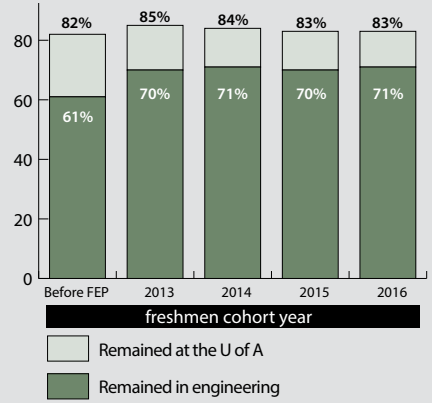
"I chose to study engineering because it was the most efficient way for me to pursue my budding interests in research and biomedical sciences while also allowing me a clear transition to graduate school. The Freshman Engineering Program not only helped me make the most of my freshman year–it also helped me make the most of being a freshman in the College of Engineering. My mentor was an incredible person who became one of my first friends within the College of Engineering and helped me with everything from getting involved on campus to finding an apartment for my sophomore year! Additionally, my honors research course gave me the incredible opportunity to meet a professor from every department in the College and hear about the current research goals within each one. It was an unforgettable and unique experience."

Provide student centered education — Our progress

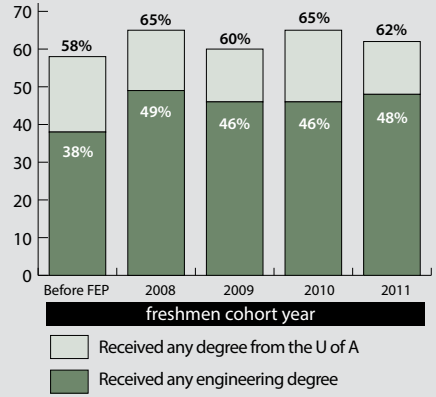
Experiential Learning
(students who participated in cooperative education, undergraduate research or study abroad)



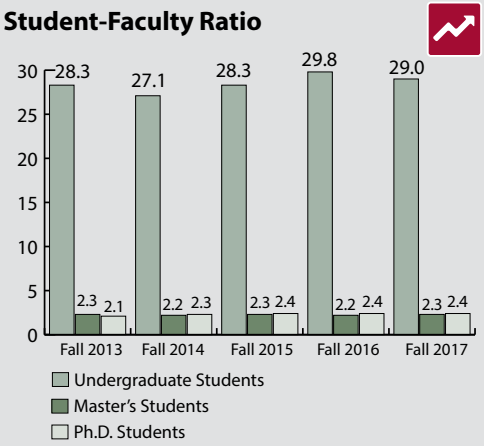
First Year Retention Rate



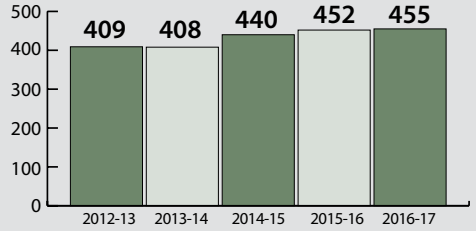
Six Year Graduation Rate



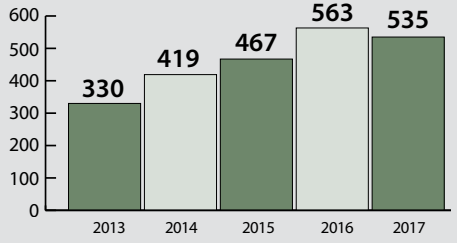
Student-Faculty Ratio



Student Semester Credit Hours per Faculty Full Time Equivalence



Bachelor's Degrees Awarded



Our future

Preparing for Tomorrow:

- In order to cement our success in retaining and graduating engineers, we are seeking to endow the Freshman Engineering Program so that it is assured support in perpetuity.
- We plan to continue to connect successful alumni with our students through classroom presentations, mock interviews, industry visits and other activities.

Our stories

Richard Cassady
Professor of Industrial Engineering and Director of the Freshman Engineering Program; Dean's Award of Excellence for Outstanding Public Service

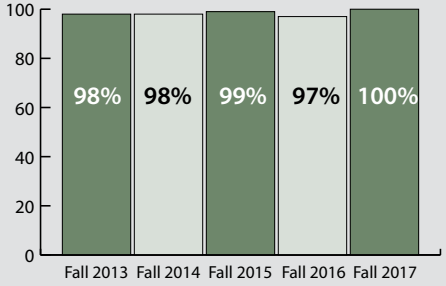
Richard Cassady has an excellent record of service to the university, to his professional organization and to the local community. He has served on numerous campus committees and task forces, and his most notable achievement in this area is his role as director of the Freshman Engineering Program, which has made a significant impact on student retention in the college.

Christa Hestekin
Associate Professor of Chemical Engineering; Ansel and Virginia Condray Endowed Professorship in Chemical Engineering; Dean's Award of Excellence for Rising Teaching

Christa Hestekin has made the education of both graduate and undergraduate students a priority in her career. She consistently receives a score of 4+ on her evaluations, and she has proven herself to be innovative and adaptable in her teaching. She is also engaged in teaching outside of the classroom, and she has been successful in securing external funding for student-centered activities like the P3 design competition sponsored by the EPA.

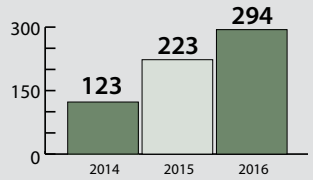
Recruit/retain high quality faculty and staff — Our progress

Faculty Retention

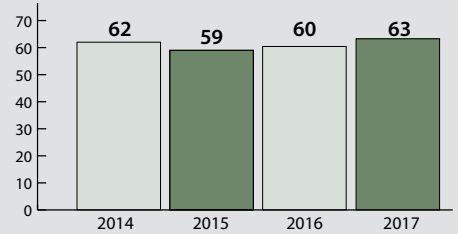


National Faculty Awards Received

Professional Service Leadership
(number of external leadership positions held by faculty)

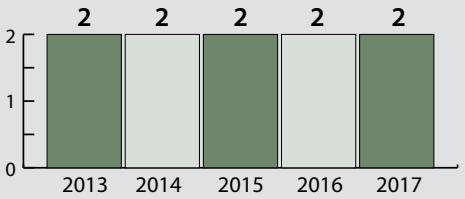


Society Fellows*

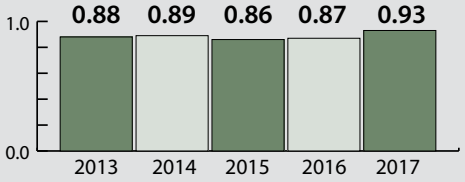


* For a complete list of fellows, see Appendix page 39

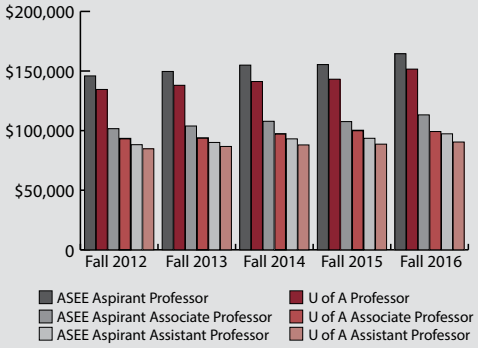
Membership in the National Academy of Engineering



Staff-Faculty Ratio



U of A and American Society for Engineering Education (ASEE) Average Faculty Salary Comparisons*



* ASEE salary survey data for fall 2017 is not available until January. Instructor salaries are not benchmarked in the ASEE salary survey.

Our future

John White
Distinguished Professor of Industrial Engineering; John Imhoff Award for Teaching

Over his 54-year career, John White has taught more than 5,000 engineering students. In addition to teaching, he also contributes to student learning through his textbooks and published papers. Three of his six co-authored books received book-of-the-year awards from the Institute of Industrial and Systems Engineers. Students he has taught or mentored have received awards at design contests, co-authored papers as undergraduates, been selected as U of A Seniors of Significance and received best paper awards at national conferences.

Ranil Wickramasinghe
Professor of Chemical Engineering; Ross E. Martin Endowed Chair in Emerging Technologies; John Imhoff Award for Research

Ranil Wickramasinghe is an internationally recognized leader in membrane science and technology. His signature accomplishment at the U of A was the establishment of our campus as a site of the Membrane Science, Engineering, and Technology Center, or MAST Center. MAST now comprises three campus sites and is one of the longest running Industrial/University Cooperative Research Centers at the National Science Foundation.

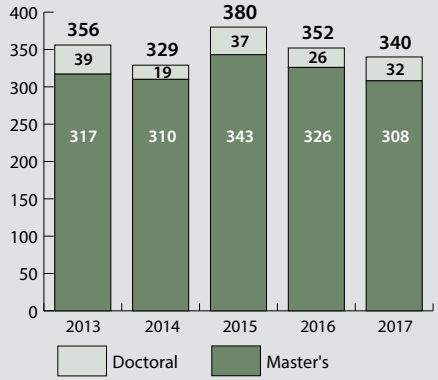
Our stories

Heather Nachtmann
Associate Dean for Research
Professor of Industrial Engineering

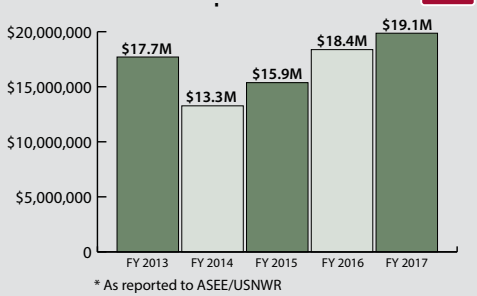
"Engineers are results-oriented and problem solvers, and our researchers are no exception. Our researchers are creating more efficient solar panels and finding ways to integrate them into the power grid, examining materials on the nanoscale in order to create new technologies and products, and investigating new approaches in infrastructure to make our buildings, roads and water sources safer. Much of this work leads directly to benefits for the state. Our faculty and students are working on Arkansas roads, collaborating with Arkansas farmers and testing Arkansas water supplies. They are also starting new companies that contribute to the economy and intellectual capital of our region. Our faculty and students want to make the world a better place, and they have the talent and innovative spirit to do so."

Increase research productivity — Our progress

Advanced Degrees Awarded

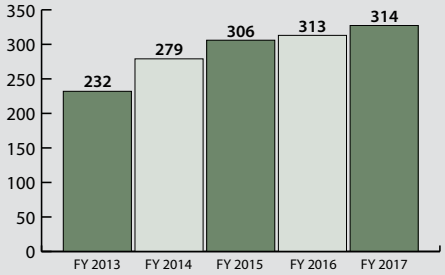


Total Research Expenditures*

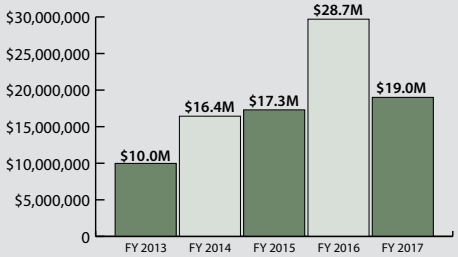


* As reported to ASEE/USNWR

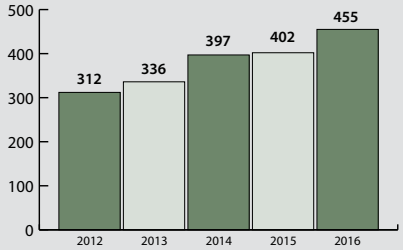
Research Proposals Submitted



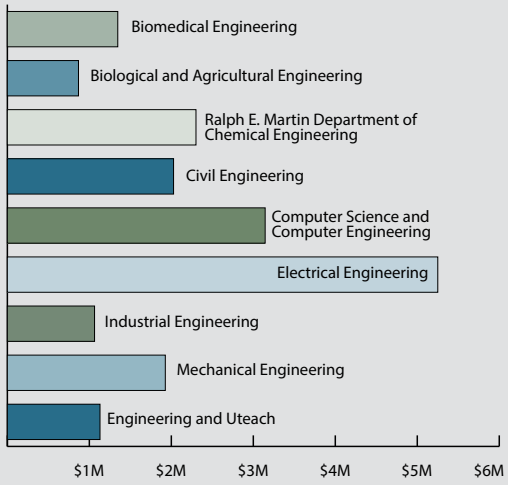
New Research Grants Received



Peer-Reviewed Publications



Research Expenditures by Department (FY 2017)



Our future

Lauren Greenlee
Assistant Professor of Chemical Engineering; Louis Owen Professorship in Chemical Engineering; Dean's Award for Rising Star

In the past year, Lauren Greenlee published three peer reviewed papers in prestigious journals, with another one under review. She received a major external award for new investigators, the 3M Non-tenured Faculty Award, and she has given five invited talks. She is a PI or co-PI on seven external grants from federal and private agencies and has significant state and university funding.

Yanbin Li
Distinguished Professor of Biological and Agricultural Engineering; Tyson Endowed Chair in Biosensing Engineering ; Dean's Award for Collaborative Research Faculty

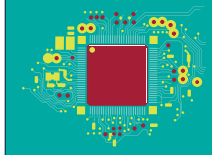
Yanbin Li has a sustained record of active collaborations both within and outside the college, and has received numerous awards and recognitions, from both the university and national organizations. He is currently involved in a collaborative project which focuses on improving food safety in the Chinese poultry industry. This project has brought together researchers from biological and agricultural engineering, industrial engineering, supply chain management and poultry science, along with the Walmart Foundation, three Chinese universities, a Chinese research institute and three Chinese poultry companies.

university of arkansas college of engineering

RESEARCH STRENGTHS

EXISTING strengths

In January 2014, a research task force appointed by dean John English identified existing and emerging strengths in the college. Existing strengths are those areas where the college is already nationally recognized. Emerging areas are fields where the college has some key presence, expertise and momentum. These are expected to emerge into strengths with additional investment. The full report can be found at engineering.uark.edu.



Electronics

The College of Engineering has been producing graduates focused on electronics for over 30 years. Researchers in this area are developing new materials for circuits and photovoltaic cells, designing and modeling circuits, creating packages that protect and integrate electronic devices and creating and testing new technologies to improve our power grid.

- Research centers predominately working in this area include the Center for Power Optimization of Electro-Thermal Systems, Grid-Connected Advanced Power Electronic Systems (GRAPES), High Density Electronics Center (HiDEC) and the National Center for Reliable Electronic Power Transmission (NCREPT)
- Approximately $4 million per year in research expenditures
- Several startup companies have emerged from this area

Energy

The broad area of energy has a foundation in electronics, but has expanded to include power systems, energy storage, smart grid innovation, biofuels and oil and gas research. As the world struggles to find and integrate safer and more sustainable sources of energy, research in this field is more important than ever.

- The Cybersecurity Center for Secure Evolvable Energy Delivery Systems along with GRAPES and NCREPT contribute to the college's annual research expenditures of $4 million
- Energy research in the college is supported by the National Science Foundation, Department of Energy and Department of Defense
- Tech transfer of this research is making significant contributions to the college's public and private energy partners

Biomedical and Healthcare Engineering

College of Engineering research encompasses both technological and biological investigations in biomedical and healthcare engineering. Many life-enhancing breakthroughs in medicine and healthcare delivery result from research combining engineering and the medical sciences including biomechanics and mechanobiology, biomaterials, cell and tissue engineering, healthcare logistics and medical decision making.

- The college conducts approximately $2 million in annual research expenditures in this area including work done by the Membrane Research Center
- This is one of our most collaborative research areas with faculty from all eight departments working together to obtain funding from health agencies including the National Institutes of Health
- Researchers in this area collaborate with industry and healthcare providers to improve health and wellness throughout Arkansas and the U.S.

Materials Science and Engineering

Our college's innovations in materials science and engineering lead to improved materials to solve technological and societal problems. Our research activities include advanced materials for packaging, control analysis, high resolution and device characterization, advanced coatings and surface engineering, photovoltaic materials, thermoelectric materials, nanotribology and bioinspired functional surfaces and materials.

- Materials research is conducted at the Center for Advanced Surface Engineering and Institute for Nanoscience and Engineering which are supported by micro-fabrication at HiDEC and in labs throughout the college
- Annual research expenditures in this area approach $2 million
- Several startup companies were created such as the award-winning NanoMech and SurfTec demonstrating successful tech transfer in this area

Transportation and Logistics

The College of Engineering has been a national leader in transportation and logistics for more than twenty years. Researchers are looking at distribution, transportation, information technology and software solutions, and maritime and multimodal transportation.

- The Mack-Blackwell Transportation Center and Center for Excellence in Logistics and Distribution have been at the fore-front of research in this area for two decades
- Annual research expenditures in this area consistently exceed $3 million
- The college works closely with the Arkansas and U.S. Departments of Transportation and many other transportation stakeholders across the nation

EMERGING areas

Aerospace
The U of A is moving to respond to this area, which is the single largest export market from the state of Arkansas.

Big Data/ Data Analytics
Technology has increased the amount of data we produce, leading to an increased need to analyze this data.

Cybersecurity
Researchers are looking at increasing digital security and information assurance, especially in the areas of transportation and the power grid.

Infrastructure
As a land-grant institution, the U of A has a responsibility to maintain the nation's water and electric resources, communications and transportation.

Advanced Manufacturing
Keeping manufacturing jobs in America and maintaining our competitiveness in this area is key for economic growth.

Optoelectronics
This field is emerging from the broader field of electronics. It involves new semiconductor materials, biophotonics and photovoltaics.

Sustainability
Faculty across the college are engaged in some form of research involving sustainable practices, design or technologies.

Systems Integration
This area encompasses research in automation, robotics and systems and process control, and inspires keen interest in our students.

Water
Research in this area includes water quality, wastewater treatment and watershed management.

UNIVERSITY OF ARKANSAS

Our stories

Whether you know it or not, you probably own items covered in polytetrafluoro-ethylene, or PTFE. This material is non-reactive, repels water, resists corrosion and reduces friction, which makes it useful for coating cookware, but it also has industrial applications as a solid lubricant, reducing friction and wear in machinery.

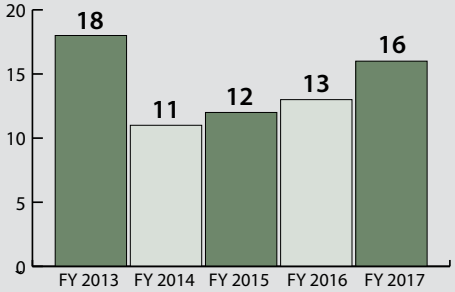
However, as anyone who has owned a non-stick pan knows, PTFE coatings wear off easily. The non-stick property that makes this material such a good solid lubricant also means it can be easily scraped from a metal surface by an errant fork or spatula.

Min Zou, professor of mechanical engineering, and Samuel Beckford, CEO of SurfTec, have been researching ways to improve the performance of PTFE as a solid lubricant. Zou and Beckford, who was her graduate student at the time, discovered that incorporating silica nanoparticles into the PTFE increased its resistance to wear without sacrificing the lubricating qualities of the substance.

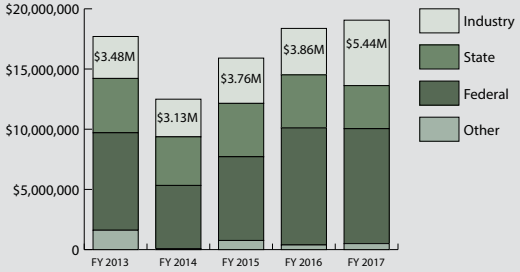
The two researchers also developed an adhesive that bonds PTFE more securely to a metal surface. Beckford received his PhD in 2014, and he and Zou turned their research into a startup company. SurfTec, LLC focuses on providing a replacement for lead-based journal bearings, which are used in electric motors and generators.

Increase economic development — Our progress

Invention Disclosures



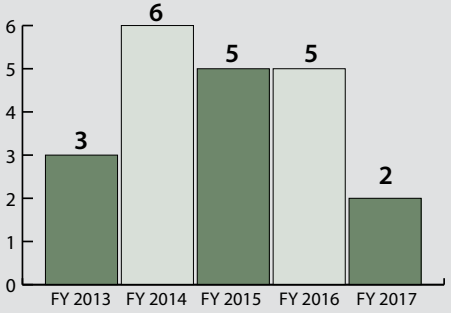
Research Expenditures by Source*



* As reported to ASEE/USNWR

** Other category includes: foreign governments, foundations, other non-governments

Patents Awarded



College of Engineering Startup Companies

Since 1990, 25 companies have been created based on engineering research at the U of A.

Our future

Preparing for Tomorrow:

- We plan to encourage faculty development in entrepreneurship, by providing opportunities such as commercial concept testing, academics in residence positions in industry, economic development initiatives and community service.

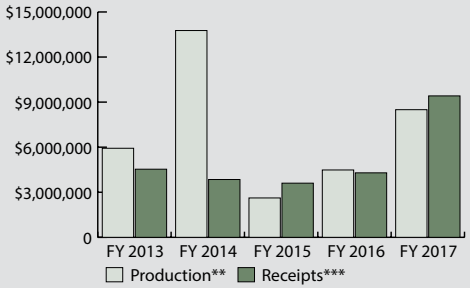
Our stories

Melinda Faubel
B.S.I.E. 1980
Director of External Affairs, AT&T Arkansas;
Chair of the Engineering Dean's Advisory Council

"The College of Engineering has made a very significant impact on my life, but the impact the college is making on our state is immense. I am truly proud that I graduated from the University of Arkansas College of Engineering. The college is achieving impressive results and is filled with remarkable students. The faculty and staff are exceptional in providing superior education and research in their support of our students. My fellow advisory board members are outstanding leaders who are working throughout the U.S. and across the globe. I'm especially proud of the focus the college puts on recruiting and retaining underrepresented groups including women, minorities, and first generation college students. Now, more than ever, the young people of our state, region, and nation are finding that engineering is a viable direction for their lives. It is exciting to see the new perspectives brought in to our companies and communities because of the opportunities created in our own College of Engineering."

Increase alumni and corporate partnerships — Our progress

Philanthropic Giving*

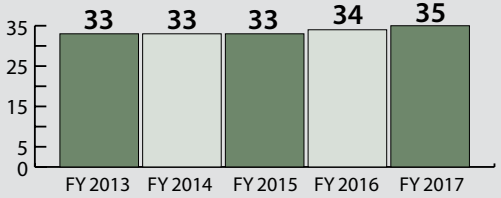


* For more information, see Gifts and Endowments chart on Appendix page 37.

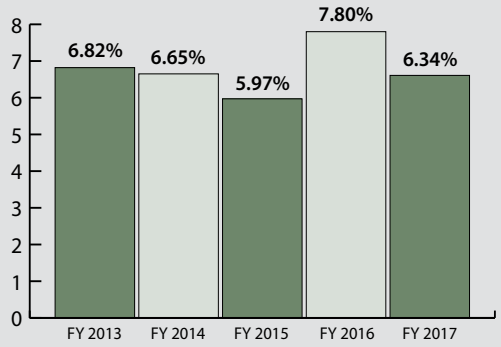
** Production: new gifts received or pledged during the fiscal year, including payments that will be received in future years.

*** Receipts: gifts received during the fiscal year, including payments on pledges from prior fiscal years.

Endowed Faculty Positions



Percentage of Alumni Who Give

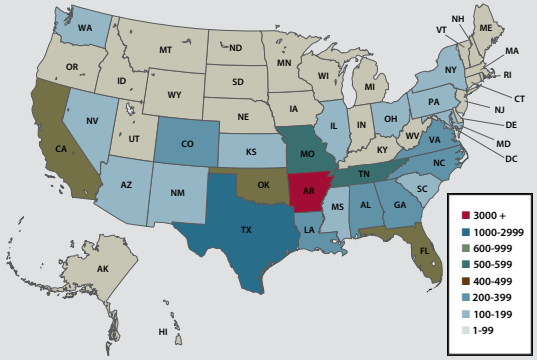


Endowed Scholarships and Fellowships

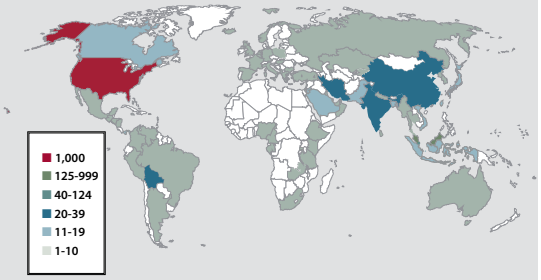
2016: **133**

2017: **139**

Alumni By State



Alumni By Country



Our future

2017 Hall of Fame Award

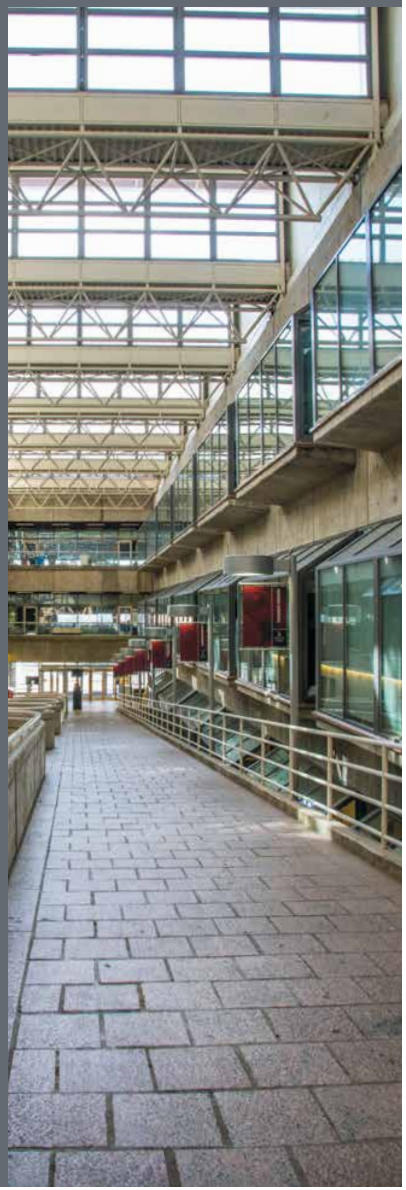
- Bob H. Crafton, BSCE 1957
- Larry G. Stephens, BSIE 1958

2017 Distinguished Alumni Award

- Pat Bourne, BSEE 1968
- Bob Harrison, BSME 1974
- Pam McGinnis, BSIE 1990
- Lynn Moore, BSCSE 1994, MSCSE 1996
- Mike Shook, BSAGE 1982
- Michael Wood, BSCHE 1984
- Carl Yates, BSCE 1958

2017 Early Career Award

- Andy Davis, BSCE 1999, MSCE 2001
- Adam Ekenseair, BSCHE 2005
- Matt Francis, BSEE 2003, BS 2004, MSEE 2007, PhD 2009
- Amanda Furr, BSIE 2003
- Toni McCrory, BSBE 2007
- Jonathan Schisler, BSCMP 2004, MSCMP 2005
- Matt Zwicker, BSME 2003



Renovated Space

	Academic	Research
2015	5,236 ft²	8,200 ft²
2016	6,420 ft²	14,449 ft²
2017	10,325 ft²	6,209 ft²

Renovation Investment

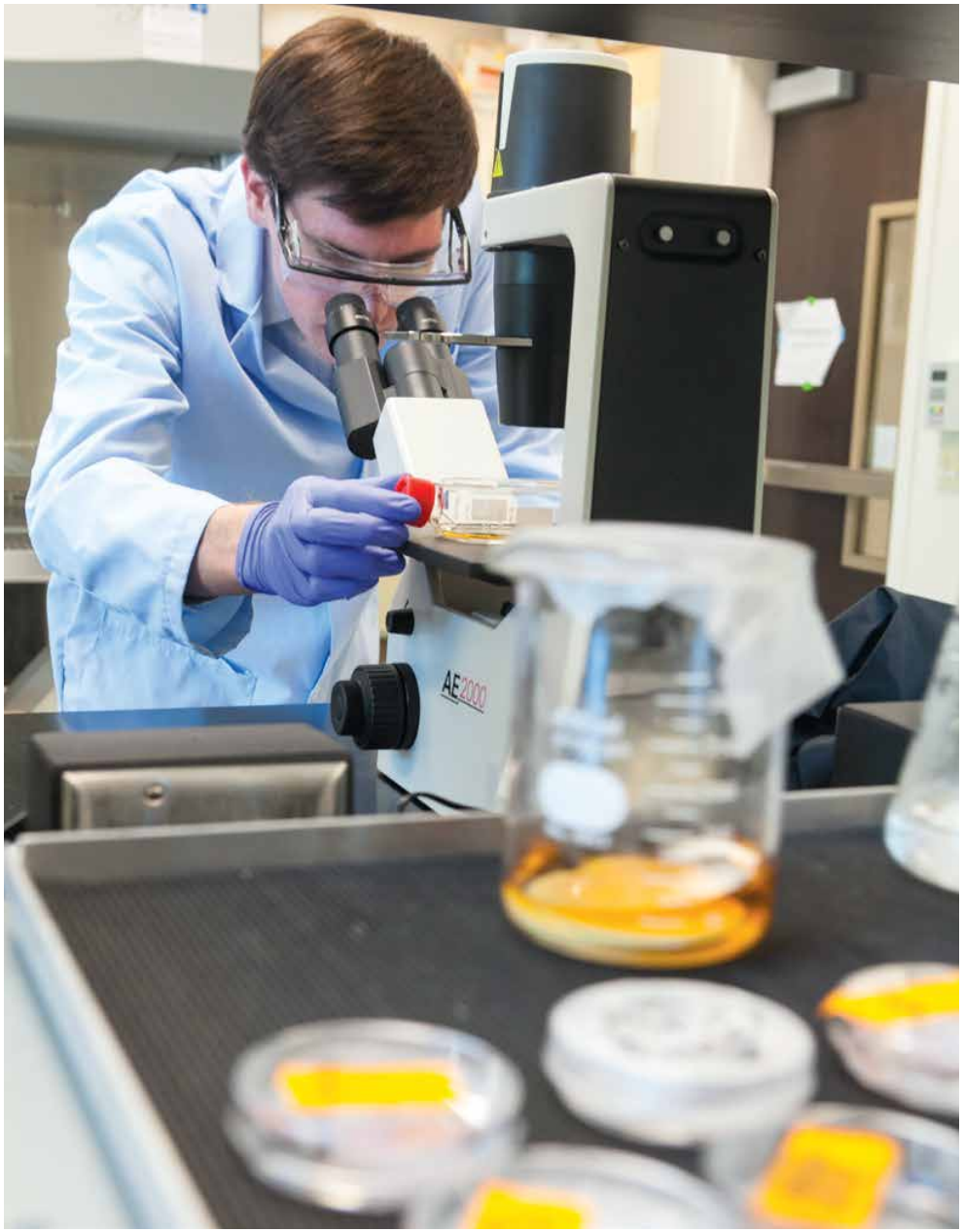
	Academic	Research
2015	$546,000	$304,000
2016	$229,500	$430,500
2017	$553,900	$608,100

Total Space

	Academic	Research
2015	77,416 ft²	92,272 ft²
2016	84,229 ft²	102,067 ft²
2017	84,229 ft²	102,067 ft²

Preparing for Tomorrow:

- The college plans major renovations to John A. White, Jr. Engineering Hall. This historic building has housed engineering classes and labs since 1927. We plan to upgrade the space and create a classic interior that pays homage to the building's rich history.
- Construction of the Civil Engineering Research and Education Center will provide research space for structures analyses and allow the Department of Civil Engineering to remain regionally competitive.



Appendix

Revenues (excluding gifts)

	FY 2013		FY 2014		FY 2015		FY 2016		FY 2017	
State Appropriations & Tuition	$20,117,970	46.86%	$20,787,672	48.42%	$21,712,044	45.81%	$22,948,204	48.42%	$24,090,402	43.59%
Distance Learning Revenues, Ft Smith, Service Centers, Conferences	$3,335,980	7.77%	$3,103,014	7.23%	$3,140,177	6.63%	$3,325,452	7.02%	$3,362,663	6.35%
Research Incentive Funds	$1,635,454	3.81%	$1,643,657	3.83%	$942,325	1.99%	$1,077,827	2.27%	$953,566	1.80%
Biological Engineering Teaching and Agricultural Experiment Station*	$1,947,726	4.54%	$1,787,000	4.16%	$1,851,719	3.91%	$1,893,397	4.00%	$1,898,336	3.58%
Sponsored Research**	$14,930,781	34.78%	$11,805,030	27.49%	$15,907,692	33.57%	$18,372,457	38.77%	$19,057,463	35.99%
Sponsored Activities and Scholarships	$1,336,218	3.11%	$1,518,160	3.54%	$1,537,123	3.24%	$1,658,126	3.50%	$900,368	1.70%
Student Equipment Fee Revenues (TELE-net)	$2,092,715	4.87%	$2,286,709	5.33%	$2,302,119	4.86%	$2,436,534	5.14%	$2,689,449	5.08%
Total	**$45,396,844**		**$42,931,241**		**$47,393,199**		**$51,711,996**		**$52,952,247**	

* Cooperative Extension Service not included.
** As reported to ASEE and USNWR.

Expenditures (excluding gifts)

	FY 2013		FY 2014		FY 2015		FY 2016		FY 2017	
Salary and Benefits	$16,572,659	34.76%	$17,363,641	37.64%	$18,744,220	40.09%	$18,211,503	35.70%	$21,296,537	38.56%
Operating Expenditures	$2,751,265	5.77%	$2,615,636	5.67%	$1,301,172	2.78%	$1,149,449	2.25%	$922,571	1.67%
Dept Restricted Fees/Misc	$2,466,727	5.17%	$2,773,673	6.01%	$1,239,293	2.65%	$1,121,038	2.20%	$754,493	1.37%
Student Equipment Fees	$1,606,694	3.37%	$2,122,512	4.60%	$2,241,529	4.79%	$2,082,936	4.08%	$2,137,758	3.87%
Scholarships	$302,547	0.63%	$527,343	1.14%	$758,241	1.62%	$482,364	.95%	$343,444	0.62%
Research*	$23,972,316	50.29%	$20,729,821	44.94%	$22,476,266	48.07%	$27,966,133	54.82%	$29,770,215	53.91%
Total	$47,672,208	100%	$46,132,626	100%	$46,760,722	100%	$51,013,423	100%	$55,225,019	100%

* Reported and compiled by the U of A Research Accounting Office and submitted to NSF.

Appendix

Gifts and Endowments*

Revenue	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Contributions - Expendable	$2,709,746	$1,126,807	$871,121	$1,390,103	$1,310,687
Contributions - Endowed & Restricted Gifts	$1,072,257	$5,238,427	$3,620,544	$1,303,521	$948,276
Investment Income:					
Expendable	$2,322,307	$2,577,659	$2,617,325	$2,816,073	$2,969,366
Endowed (reinvestment)	$1,042	$0	$0	$0	$0
Endowed Market Value Adjustment	$4,133,111	$6,979,898	($298,852)	($4,280,657)	$6,814,020
Net Transfers and Allocations	$13,743	($1,224,342)	$0	$0	$0
Total Revenue	**$10,252,206**	**$14,698,448**	**$6,810,138**	**$1,229,041**	**$12,042,349**

Expenditures	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Scholarships and Student Support	$1,119,101	$1,154,870	$836,285	$621,766	$621,152
Other College Support	$2,574,873	$2,272,358	$2,154,828	$2,002,086	$2,496,899
Capital Outlays	$152,525	$218,170	$72,484	$187	$7,231
Development costs**	$350,435	$347,631	$391,743	$131,177	$233,808
Total Expenditures	**$4,196,934**	**$3,993,030**	**$3,455,340**	**$2,755,216**	**$3,359,090**
Revenues less Expenditures	**$6,055,272**	**$10,705,419**	**$3,354,798**	**($1,526,175)**	**$8,683,259**

* Planned and Charitable Remainder Trust Accounts are not reported.
** Development costs budgeted from U of A Foundation funds and includes administrative overhead charges to gift revenues.

Gifts and Endowments Financial Position*

Endowment Funds Held with the University of Arkansas Foundation, University of Arkansas, and Agricultural Development Council

	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Cash and Cash Equivalents - Expendable	$9,411,703	$8,219,552	$11,335,354	$12,807,764	$14,109,710
Pooled Investment Funds - Endowments	$46,329,354	$55,042,921	$52,222,964	$52,164,081	$55,345,454
Scholarship Endowments	$9,643,672	$12,348,260	$14,376,759	$13,770,926	$14,516,478
Fellowship Endowments	$3,305,901	$3,785,316	$3,991,624	$4,292,359	$4,934,397
Total Fund Balances	**$68,690,630**	**$79,396,049**	**$81,926,701**	**$83,035,131**	**$88,906,039**

* Planned / Charitable Remainder Trust Accounts are not reported. Biological Engineering accounts retroactively reported with Engineering.

Distance Education

The Master of Science in Operations Management program was established in 1974 and since that time it has become the largest graduate degree program offered by the University. The purpose of the program is to create value through efficiency by applying the strategic, tactical and operational activities of operations management. The program offers classes at several graduate resident centers across the region. Students may complete all the requirements for the program at one of these centers, at the Fayetteville campus, or online.

Master of Science in Operations Management		
Year	Number of Courses Offered	Student Credit Hours
2013	28	8,943
2014	29	8,994
2015	30	9,537
2016	31	9,243
2017	32	8,748

The Master of Science in Engineering program has been offering online degrees since 2009. It is a fully-accredited program taught by graduate faculty from the College of Engineering. This program is designed for students who want to further their education in a variety of engineering topics, and its graduates are well-prepared for a career in engineering and management of engineering systems, processes and organizations.

This program is consistently ranked in the top 30 for best online graduate engineering programs and best online graduate engineering programs for veterans by *U.S. News & World Report.*

Master of Science in Engineering		
Year	Number of Courses Offered	Student Credit Hours
2013	61	957
2014	62	1,116
2015	65	1,182
2016	67	1,677
2017	76	1,527

Appendix

Faculty Elected as Fellows of Professional Societies

National Academy of Engineering
Mike Johnson
John White

ASM International
Ashok Saxena
Ajay Malshe

ASHRAE
Darin Nutter

American Concrete Institute
Frances Griffith
Micah Hale

American Institute for Medical and Biological Engineering
Jin-Woo Kim
Yanbin Li
D. Keith Roper
Lalit Verma

American Society for Engineering Education
Norman Dennis
Kim Needy
John White

American Society for Engineering Management
Heather Nachtmann
Kim Needy

American Society for Testing and Materials
Ashok Saxena

American Institute of Aeronautics and Astronautics
Jim Rankin

American Society of Agricultural and Biological Engineers
Lalit Verma
Yanbin Li
Otto Loewer

American Institute of Chemical Engineers
Robert Babcock
Tom Spicer
Ranil Wickramasinghe

American Society of Civil Engineers
Norman Dennis
Findlay Edwards
Ernie Heymsfield
Mike Johnson
R. Panneer Selvam

American Society of Mechanical Engineers
Rick Couvillion
Ajay Malshe
Steve Tung
Min Zou

City and Guilds of London Institute (UK)
Simon Ang

Electrochemical Society
Simon Ang

Indian Society of Agricultural Engineers
Lalit Verma

Institute for Operations Research and Management Sciences
Greg Parnell
John White

Institute of Biological Engineering
Lalit Verma

Institute of Electrical and Electronics Engineers
Simon Ang
Samir El-Ghazaly
Alan Mantooth

Institute of Engineering and Technology (UK)
Simon Ang
Omar Manasreh

Institute of Physics
Ajay Malshe

Institute of Industrial and Systems Engineers
Richard Cassady
John English
Joseph Geunes
Heather Nachtmann
Kim Needy
Edward Pohl
Manuel Rossetti
John White

International Academy of Production Engineering
Ajay Malshe

International Congress on Fracture
Ashok Saxena

International Council on Systems Engineering
Greg Parnell

Lean Systems Society
Greg Parnell

Military Operations Research Society
Greg Parnell

National Academy of Construction
Mike Johnson

National Academy of Inventors
Hameed Naseem

Society of American Military Engineers
Mike Johnson

Society for Decision Professionals
Greg Parnell

Society of Reliability Engineers
Richard Cassady
Edward Pohl

Society of Tribologists and Lubrication Engineers
Min Zou

College of Engineering Administrative Contacts

DEANS AND ASSOCIATE DEANS

John English
Dean of the College of Engineering
Irma F. and Raymond F. Giffels Endowed Chair in Engineering
jre@uark.edu
(479) 575-3054

Norman Dennis
Senior Associate Dean
ndennis@uark.edu
(479) 575-6011

Heather Nachtmann
Associate Dean for Research
hln@uark.edu
(479) 575-3484

DEAN'S STAFF

Kim Bullard
Director of Student Records
kbullard@uark.edu
(479) 575-3053

Thomas Carter III
Assistant Dean for Student Services and Student Affairs
tic@uark.edu
(479) 575-5009

Richard Cassady
Director of the Freshman Engineering Program
cassady@uark.edu
(479) 575-6735

Stella Clark
Development Specialist
sbclark@uark.edu
(479) 575-4092

Kyle Cook
Facilities Manager
kbcook@uark.edu
(479) 575-6899

Larry Esch
Assistant Dean for Finance
esch@uark.edu
(479) 575-5699

Kristy Fink
Assistant to the Dean
kfink@uark.edu
(479) 575-3054

Brian Henderson
Director of Employer Relations and Student Placement
bwhender@uark.edu
(479) 575-6265

Bryan Hill
Assistant Dean for Student Recruitment, Honors and International Programs
bwhill@uark.edu
(479) 575-7236

Rifati Raindriati
Assistant to the Associate Deans
(479) 575-6010
rnraindr@uark.edu

Eric Specking
Director of Recruitment
especki@uark.edu
(479) 575-7780

Emily Wood
Director of Development and External Relations
ewood@uark.edu
(479) 575-3075

Photos on the following pages courtesy **University Relations**: front cover, inside front cover, 2, 3, 5, 14, 22, 23, 24, 25, 28, 29, 34, back cover

Appendix

College of Engineering Advisory Council

Melinda Faubel, Council Chair
Director of External Affairs, AT&T Arkansas

Troy Alley
Executive Vice President and COO
Con-Real, Inc.

Greg Baltz
Founder and President
Running Lake Farms

Bami Bastani
Senior Vice President
Radio Frequency Business Unit
GLOBALFOUNDRIES

Sherman Black
CEO
Conservis Corporation

Kevin Brown
Executive Vice President, Manufacturing and Refining (retired)
LyondellBasell Industries

G. Kent Burnett
Senior Vice President of IT and e-commerce (retired)
Dillard's Department Stores, Inc.

Ansel Condray
Chairman and Production Director (retired)
ExxonMobil International, Ltd.

Alan Fortenberry
CEO
Beaver Water District

Kendall Harris
Dean and Professor
Roy G. Perry College of Engineering, Prairie View A&M University

Bob Harrison
Vice President/Principal
ECCI

Grady Harvell
President
AFCO Steel

David Humphrey
Vice President, Investor Relations and Corporate Communications
ArcBest Corporation

James "Jon" Keel
Founder and CEO
Improved Results, LLC

Jack King
President and CEO (retired)
Oglethorpe Power Corporation

Rodger Kline
COO (retired)
Acxiom Corporation

Vincent Lyons
President & CEO
National Instrument, LLC

John Marshall
President and CEO
Coastal Partners, Inc.

Charles "Micky" Mayfield
Sales Vice President (retired)
Coriant

Kent McAllister
President of Projects
Wood Group- Americas

James McClelland Jr.
Chairman Emeritus
McClelland Consulting Engineers, Inc.

Pamela McGinnis
President, Global Marketing
Phillips 66

Marji McNeill
Vice President and Director, Compliance and Ethics
Flint Hills Resources

Adam Monroe
President - Americas
Novozymes

Tom Pierson
Founder and CTO
TAS Energy

Karl Schubert
President and Principal Consultant
TechNova Consulting, LLC

Patrick Schueck
Vice President
Lexicon, Inc.

Stuart Scott
Executive Vice President and CIO
J.B. Hunt Transport, Inc.

Ami Spivey
Senior Vice President International Business Processes,
Walmart Stores, Inc.

Julian Stewart
Sales and Marketing (retired)
IBM Corporation

W. Robert Storey
Principal Director, The MVR Company Manging Directory, VIC Technology Venture Development

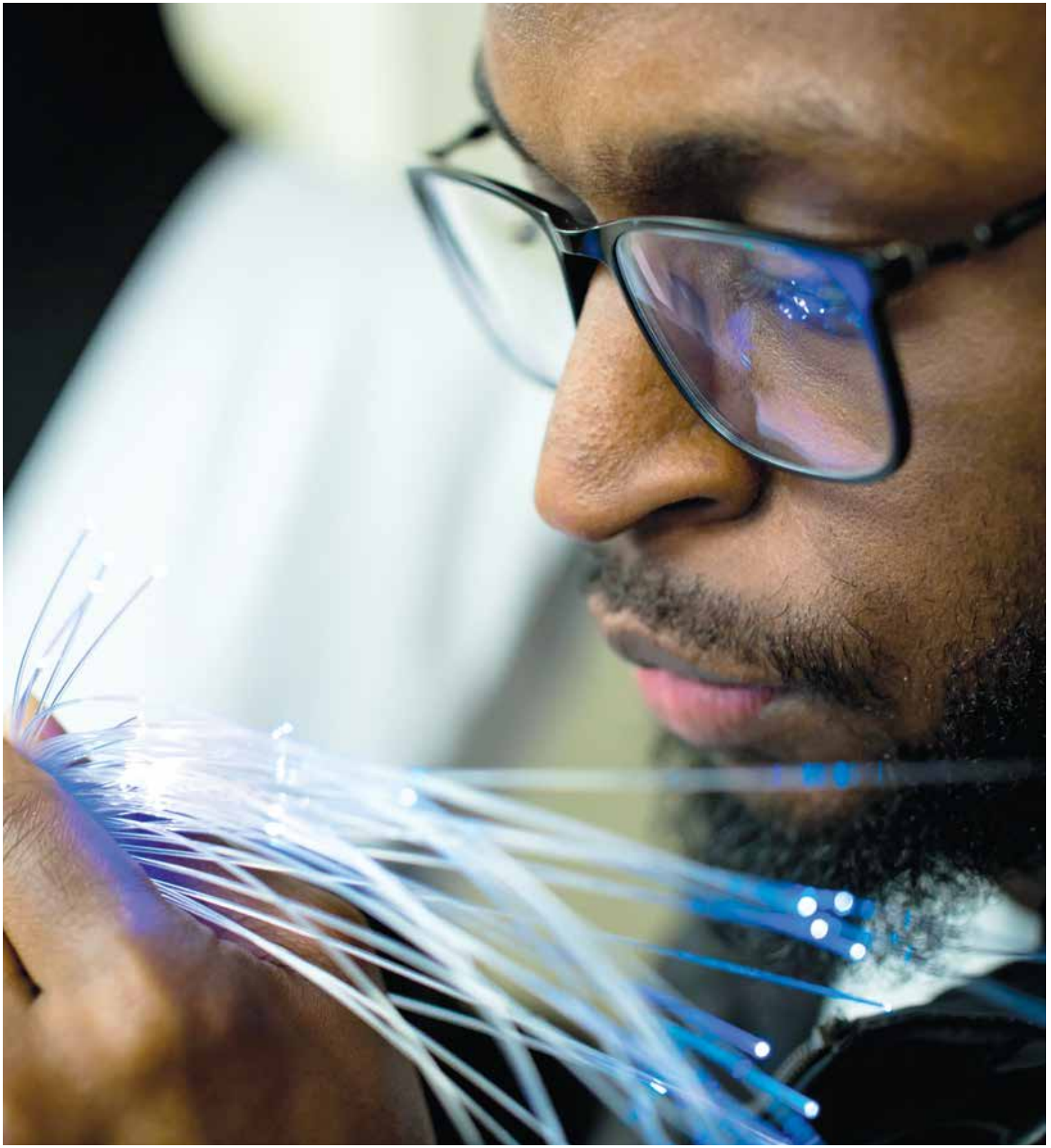
Leon Topalian
Executive Vice President
Nucor Corporation

Chris Weiser
Owner and President
JV Manufacturing

Bruce Westerman
Congressman

Dan Williams
President and CEO
Garver Engineers

Charles Zimmerman
Vice President, International Design and Construction (retired)
Walmart Stores, Inc.



Preparing You For Your Tomorrow

UNIVERSITY OF ARKANSAS

engineering.uark.edu

College of Engineering
4183 Bell Engineering Center
University of Arkansas
Fayetteville, AR 72701