

OKLAHOMA STATE UNIVERSITY
COLLEGE OF ENGINEERING, ARCHITECTURE AND TECHNOLOGY



2018-2022
STRATEGIC PLAN

COLLEGE
OF
ENGINEERING, ARCHITECTURE & TECHNOLOGY

PHILLIPS 66
STUDENT PLAZA



COLLEGE OF ENGINEERING, ARCHITECTURE & TECHNOLOGY

STRATEGIC PLAN

2018-2022

TABLE OF CONTENTS

- VISION
- MISSION
- INTRODUCTION
- PROFILE
- GOALS 2018
 - ACADEMIC GOALS
 - RESEARCH GOALS
 - EXTENSION GOALS
 - ADVANCEMENT GOALS

COLLEGE OF ENGINEERING,
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Preamble

The foundations of the College of Engineering, Architecture and Technology at Oklahoma State University were formed more than 125 years ago. The mission to provide a practical education in the mechanic arts was fundamental to our land grant roots. In the succeeding years, many of the State's leading engineering and architecture companies were founded by former students of the programs and the southern plains are built on the innovation and design skills of our graduates, innovations and training.

The future of our state's economy and our nation's place in the world depend on OSU's College of Engineering, Architecture and Technology advancing in new directions.

Innovation, interdisciplinary integration, energy and entrepreneurship will define the practical education of the next generation. OSU will engage a diverse student body in a lifetime of leadership that will shape the intellectual capital of the new US economy. The strategic changes in the college in the next five years will define OSU for future decades.



COLLEGE OF ENGINEERING, ARCHITECTURE & TECHNOLOGY

**“Leaders create a vision,
articulate the vision,
passionately own the
vision and relentlessly
drive it to completion”**

- Jack Welch



VISION

“To be the leading public university in engineering, architecture, and technology that engages diverse students, faculty, and staff with industry and government to deliver excellence in advanced learning, leadership, relevant research and benefits to society.”

MISSION

“Our mission is to provide a diverse student population with the highest quality education in engineering, architecture and technology. OSU develops ethical leaders with technical knowledge, innovation and communication skills to benefit the State of Oklahoma, the nation and the world.”

LEADERSHIP DIRECTION

The College of Engineering, Architecture and Technology is a community of scholars, innovators and leaders who are changing the world. The preparation of professionals that anticipate the needs of a changing world is at the nexus of society, economy, ethics, sustainability and humanity. The College is committed to training leaders and professionals who innovate, design and build a resilient and sustainable local, regional and world economy.

The vision and mission of the College of Engineering, Architecture and Technology emphasizes the students, and the obligation to create future designers and leaders in professions grounded in ethics, innovation and sustainability.

The five-year strategic plan is developed to guide decisions and future directions of the College of Engineering, Architecture and Technology. The strategic plan assists the leadership of the College of Engineering, Architecture and Technology (CEAT) in improving our performance by defining both the direction and metrics by which progress is measured. It is the principles by which the College defines its direction and aspirations to continuously improve and stay among the very best programs in the nation.



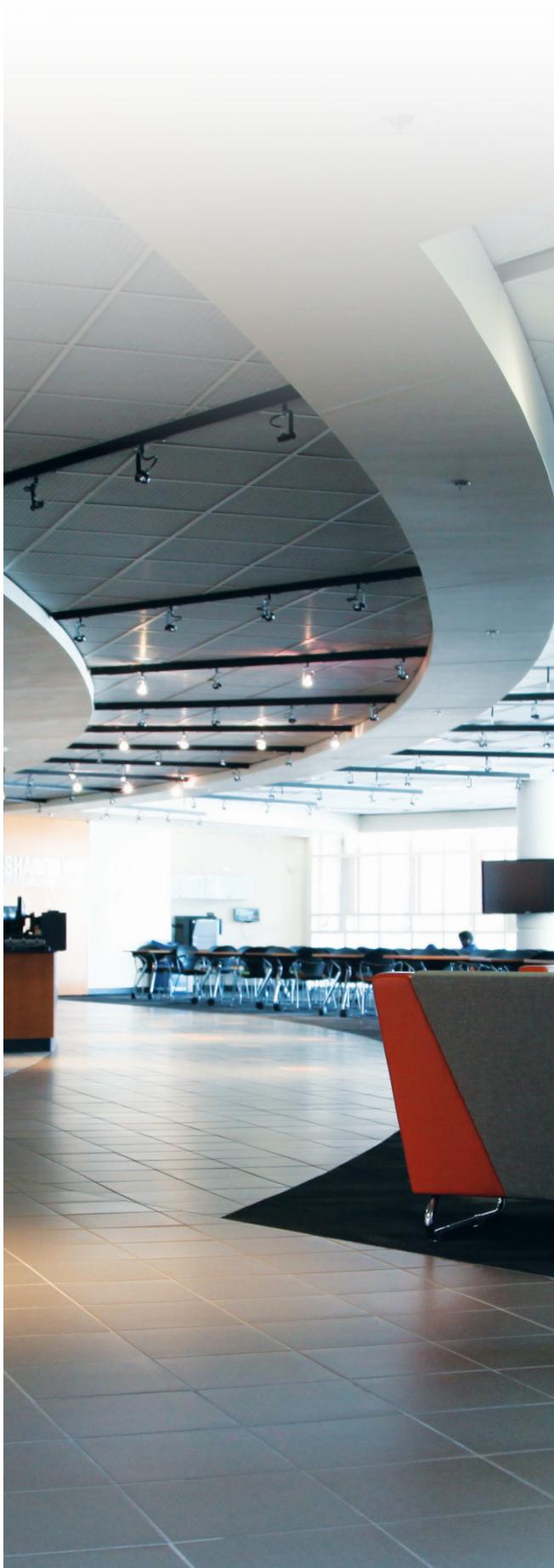


GOALS AND OBJECTIVES

The goals of the College of Engineering, Architecture and Technology at Oklahoma State University help the faculty, staff and administration achieve the College's mission. Each is a specific, measurable, achievable, realistic and time-oriented (SMART) goal presented with measurable objectives or benchmarks and strategies that will assist the faculty and staff to reach the goals, and the administration to support the goals.

There are four major goals in this strategic plan

- I. **ACADEMIC GOAL**
- II. **RESEARCH GOAL**
- III. **EXTENSION**
- IV. **ADVANCEMENT**



ACADEMIC GOAL: Recruit, retain and graduate diverse, intellectually talented students to address the engineering and architecture design challenges of the 21st century.

This goal addresses the 5-10 year needs of the State of Oklahoma, the region, and the US employers that depend on technical professionals to grow, innovate and lead their companies. With changing demographics in the region, it will require OSU to focus on admitting qualified students and provide a means for more of them to succeed in their degree program and careers.

STRATEGIES FOR THE ACADEMIC GOAL

Recruit, Retain, and Graduate Diverse, Intellectually Talented Students

1. Selectively recruit highly qualified and diverse undergraduate and graduate students to improve the quality and spectrum of thought in the classroom, laboratory and research.
2. Develop and support innovative and effective advising, monitoring and intervention protocols to increase retention and graduation rates.
3. Develop and support innovative enrichment programs to develop contextual solutions and designs.
4. Provide a coordinated and enriching first-year experience for enabling student success.
5. Provide CEAT students with a diverse array of enrichment opportunities, including undergraduate research, global experiences, entrepreneurship focus, leadership development and cultural enhancement.

Address the 21st Century Design Challenges

1. Create a culture that values teamwork, a strong work ethic, and strives for academic and professional excellence leading to the development of requisite skills to lead in a competitive and complex world.
2. Provide CEAT students with innovative courses and pedagogy to achieve excellence in mastering fundamental and advanced concepts, creative design and problem solving, and entrepreneurship.
3. Introduce the design experience early in the curriculum and provide design and teamwork experiences through a holistic integration of the curriculum.
4. Increase emphasis on interdisciplinary and hands-on learning experiences.
5. Develop and grow selected professional graduate programs to meet emerging workforce demands.
6. Develop and grow online capability to adopt and improve pedagogical innovations, operational efficiencies, and accommodate increased enrollments.

METRICS FOR ACADEMIC GOAL

Recruit

1. Average Composite ACT of 28 for CEAT freshmen. (2017: 26.67)
2. Of all CEAT graduates, 30 percent are female and 30 percent of B.S. ENGR are female. (2017: 21.5 percent and 22.8 percent)
3. Of all CEAT faculty, 30 percent are female. (2017: 15 percent)
4. Diverse CEAT UG students equal to 40 percent. (2017: 30.7 percent)
(4.4 percent Af. Amer/ 13.4 percent Nat Amer/ 8.9 percent Hispanic/ 4 percent Asian)
5. 30 percent of CEAT freshmen or transfers are from out-of-state (2017: 16 percent)

Retain

1. 90 percent of CEAT new freshmen are retained to their sophomore year at OSU. (3 year average: 83 percent)
2. 35 percent of CEAT new freshmen graduate within four years of entering CEAT. (2017: 27 percent)
3. 75 percent of CEAT new freshmen graduate within six years of entering CEAT. (2017: 65 percent)
4. Average time to graduation equal to 4.5 years. (2017: 5 years.)
5. 500 CEAT students living in CEAT or Honors Living Learning Communities. (2017: 340)
6. Financial support provided to 400 CEAT students each year to participate in leadership development programs such as CEAT Scholars, Grand Challenge Scholars Program, WW Allen Scholars, Phillips 66 SHIELD Scholars, Living Learning Community Mentors, CEAT Ambassadors, etc. (2017: 128)

Enrich

1. 200 students per year participate in global engineering/architecture experiences. (2017: 120)
2. 20 students per year graduate from CEAT as Grand Challenge Scholars. (2017: 2)
3. 15 percent of students graduate with significant undergraduate research experience. (2017: 4 percent)

Improve

1. 40 percent of CEAT graduates participate in an interdisciplinary senior design project. (2017: 1 percent)
2. Open-ended, hands-on lab experiences are successfully integrated into core ENSC courses.
3. Be considered among the top 40 public US academic undergraduate programs in engineering, architecture and technology. (2017: 49th, 2012: 76th)

COLLEGE OF ENGINEERING, ARCHITECTURE & TECHNOLOGY

RESEARCH GOAL: Create impact through a growing research enterprise that engages faculty and students in funded federal, state, and industry-based innovation.

This goal addresses the 5-10 year needs of CEAT to mentor our students in innovation and provide intellectual capital to the economy of Oklahoma and beyond. As a major public research institution, OSU has the mandate to help develop sustainable enterprises that improve the economy through innovation, reduce the impact of energy use on our resources and environment, and contribute to a better and more secure nation and world. energy use on our resources and environment, and contribute to a better and more secure nation and world.

STRATEGIES FOR THE RESEARCH GOAL

Growing the Research Enterprise

1. Target research efforts valued by specific agencies/industries around portfolio-strong areas of expertise.
2. Leverage and invest in existing strengths (Space Grant, USRI, etc.).
3. Seed and enable research development in new strategic areas.
4. Recruit high quality graduate students.
5. Compete for large efforts (multi-MM\$, multi-departmental/disciplinary RFPs – INFEWS, Consortia, etc.)

Create Impact through Innovation and Interdisciplinary Centers

1. Start student innovation center with SSB and ENDEAVOR.
2. Develop and implement a comprehensive plan to advance our future in all forms of energy engineering.
 - a. Petroleum – Oil and Gas
 - b. Renewable Energy – Wind, Solar, Geothermal, Biomass
 - c. Sustainable Energy Innovation – Efficiency, Integration, IOT
3. Expand the Aerospace and Unmanned Systems Development Programs.

Engage Faculty and Students

1. Communicate our success.
2. Create financial incentives for Schools to engage in revenue generating activities.
3. Mentor faculty leadership for large collaborative center efforts.
4. Award faculty for outstanding research efforts.
5. Increase transparency of all research related data.
6. Provide excellent services in proposal writing and administrative support to permit faculty to obtain and sustain federal, state and industrial research funding.

METRICS FOR RESEARCH GOAL

Growing Research Enterprise - Metrics for 2022

1. Conduct \$26 million in research expenditures by tenure track and research faculty. (2017: \$16.3M)
2. Add \$3 million in research infrastructure per year.
3. 30 faculty leading >\$200k-\$500k/yr research. (2017: 15)
4. 12 faculty leading >\$500k/year. (2017: 6)
5. Add 20 tenure-track faculty to growing research areas.

Create Impact through Innovation and Interdisciplinary Centers - Metrics for 2022

1. Operate 5 self-sustaining \$1M+/year research centers. (2017: 2 - NPDC and USRI)
2. Invest \$1.5 million in research center support to accelerate faculty synergistic success.

Engage Faculty and Students

1. Provide between \$300k/\$1M in expenditures/year in discretionary research funding to Schools. (2017: \$0)
2. Create 15 named \$4k/year Graduate Fellowships for domestic student support. (2017: 1)
3. Provide 50 students/year with significant undergraduate research experience. (2017: 20)
4. Graduate 60 PhD/year. (2017: 29, 3-year average: 42)



ADVANCING EXTENSION GOAL: Expand innovation and theory into forward looking practices, create solutions, empower partnerships and relationships, and deliver applied knowledge and skills to create sustainable global impacts and inspire world-class stakeholders.

This goal addresses the 5-10 year needs of CEAT to serve the professional community with advancing technical and practical skills that allow Oklahoma to remain competitive. As a land-grant institution, OSU has the mandate to serve the state to improve the economy through innovation, reduce the impact of natural disasters, elevate the safety of its citizens, and bring technical advances to its industries and public agencies.

STRATEGIES FOR THE EXTENSION GOAL

Expand Innovation and Theory into Forward Looking Practices, Research, Development and Delivery

1. Engage CEAT faculty and students in engineering extension programs.
2. Establish a unique marketing and communications model, including brand that increases CEAT's reputation for high-value extension applied research, education and training.

Create Solutions; Empower Partnerships and Relationships

1. Enhance and increase educational and training opportunities by integrating advanced digital technology and adult education best practices to the delivery of engineering extension courses and programs.
2. Partner with other state, national and international organizations to deliver needed extension services.

Deliver Applied Knowledge and Skills

1. Engage CEAT students, faculty, alumni, K-12 educators and Oklahoma communities in STEM programs that inspire K-12 students to pursue careers in engineering, architecture and engineering technology disciplines.
2. Expand professional development offerings to keep the workforce at the advancing edge of safety and productivity.



METRICS FOR EXTENSION GOAL

Expand Innovation and Theory into Forward Looking Practices - Metrics for 2022

1. Conduct \$25 million/year in extension and auxiliary services to promulgate knowledge transfer. (2017: \$18.1M)
2. Add \$2 million in training infrastructure.
3. Expand accreditation to 50 institutions of higher education (2017: 37); 90 state, provincial and international training agencies (2017: 65) and 100 fire academies and local/regional fire training academies. (2017: 00)
4. Engage 200 undergraduate and graduate students annually in research, development, and delivery of engineering extension initiatives. (2017:100)
5. Engage 40 faculty annually in engineering extension initiatives. (2017:23)
6. Increase awareness of academic faculty, college and university leaders, industry stakeholders, and OSU alumni regarding engineering extension units, initiatives and accomplishments.

Create Solutions; Empower Partnerships and Relationships - Metrics for 2022

1. Expand partnership at OSU-Tulsa to double the extension services. (2017: \$200k)
2. Increase public and private partnerships by 25 percent to deliver needed education, training, and extension services. (2017: 200/200)
3. Increase services provided to State of Oklahoma county assessors by changes in current legislation (CAMA).
4. Increase digital technology-delivered extension courses and programs by 75 percent. (2017: 25)

Deliver Applied Knowledge and Skills - Metrics for 2022

1. Increase STEM programs and services to annually reach 15,000 K-12th grade students. (2017: 500)
2. Increase annual professional development offerings provided to public and private workforce by 5 percent. (2017: 11,000)
3. Increase students annually completing professional development courses by 5 percent. (2017: 73,000)

COLLEGE OF ENGINEERING, ARCHITECTURE & TECHNOLOGY

ADVANCEMENT GOAL: Elevate the reputation, engagement and resources of the college to be among the top public engineering, architecture and technology programs in the US.

This goal addresses the 5-10 year needs of CEAT to demonstrate to students, alumni, stakeholders, and peer institutions the high quality of education, research, and engagement OSU delivers. It also articulates the need for the resources to provide these opportunities and training. Through execution of this goal, CEAT will improve its external reputation and engage alumni and industry in a partnership to deliver leaders for the companies and agencies of Oklahoma and the nation.

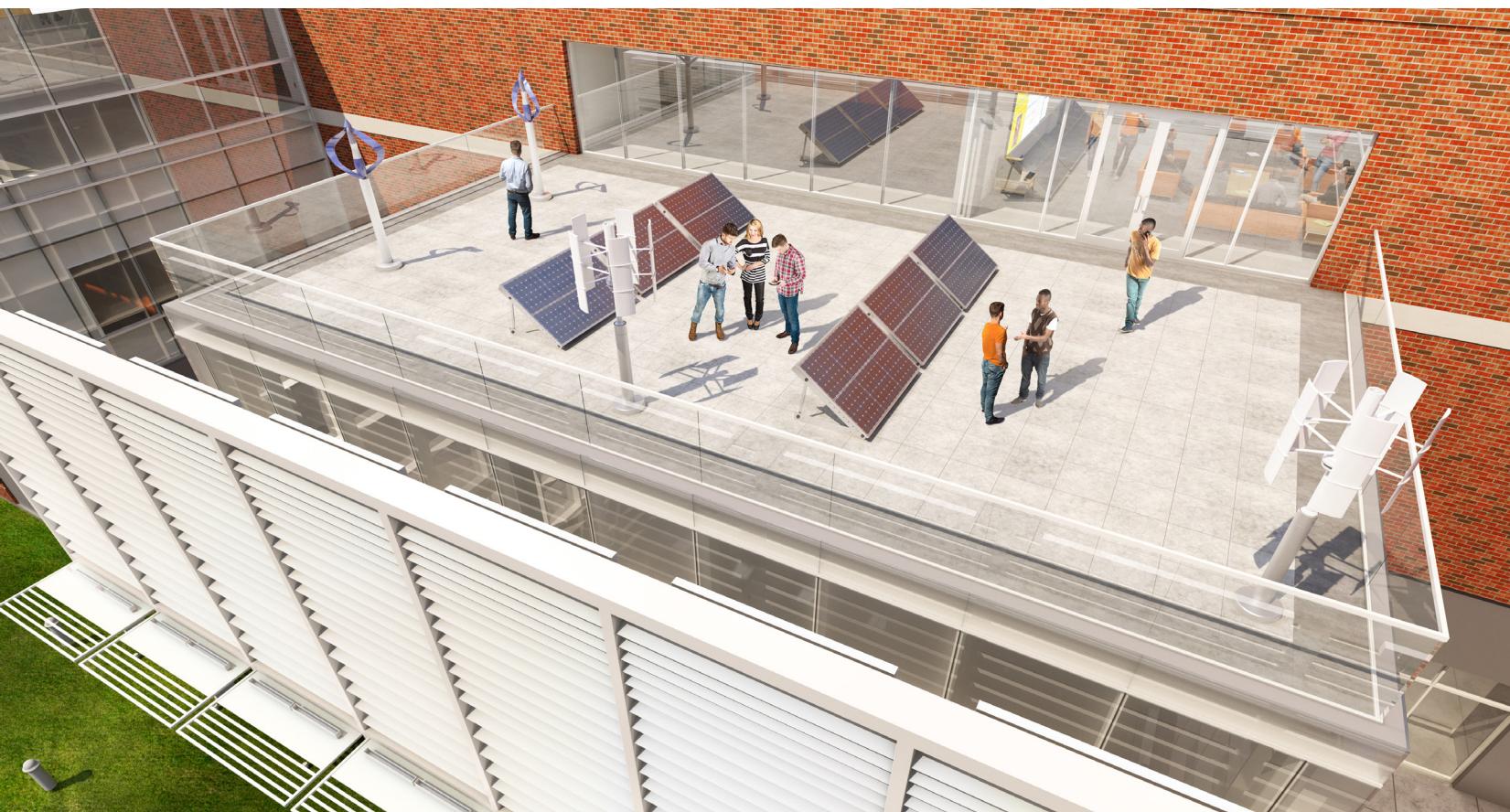
STRATEGIES FOR THE ADVANCEMENT GOAL

Elevate the Reputation of the College

1. Communicate the achievements and standards of the students, faculty and staff.
2. Increase the scholarly recognition of the faculty, students and research efforts of the College.
3. Increase the participation of students in research, community engagement, and global experiences.

Elevate the Resources of the College

1. Educate alumni, friends and corporations on the opportunities to advance the mission of the College through financial, in-kind and expertise contributions to OSU and CEAT.
2. Increase the financial support provided by the legislature and stakeholders to fund programs that meet the intellectual capital needs of the state.



METRICS FOR ADVANCEMENT GOAL

Elevate the Reputation of the College

1. Rise to be among the top 40 public undergraduate engineering colleges in the US, top 25 Architecture programs in the US and Top 10 Engineering Technology programs in the US. (**2017: 49 ENGR, unranked in ARCH**)
2. Publish 15 feature articles in professional publications, and 12 news items carried by national media. (**2017: 3/3**)
3. Rise to be among the top 60 public graduate engineering colleges. (**2017: 87**)
4. Increase the mid 50 percent of freshmen entrance preparation scores from **ACT 24-28** to ACT 25-30.
5. Increase the size of the CEAT scholars program to 300 students. (**2017: 88**)

Elevate the Resources of the College – Metrics 2022

1. Increase the tuition/fee funding of the college to a level of the 50th percentile of the aspirational peer public engineering programs. (**2016-2017: 9th percentile**)
2. Externally raise \$15 million/year for support of students, programs and capital development. (**2017: \$9.9M**)
3. Increase lab, classroom and office space proportional to our growth.

ASPIRATIONAL PEER PUBLIC UNIVERSITIES

Clemson University
Iowa State University
Kansas State University
Louisiana State University
Michigan State University
Missouri University S&T
North Carolina State University
Oklahoma State University
Rutgers University
Texas A&M University
Texas Tech University
The University of Iowa
The University of Texas at Austin
University of Kentucky
University of Maryland
University of Minnesota

University of Nebraska-Lincoln
University of Oklahoma
University of Pittsburgh
University of Tennessee
University of Utah
University of Wisconsin-Madison
Washington State University
West Virginia University

CEAT STRATEGIC ADVISORY COUNCIL

| | | | |
|--|---|---|--|
| Debbie Adams Phillips66 | John Doerner XTO Energy | Mitch Johnson Consultant | Ty Ropp OSUF |
| Stephen Allen Anadarko Petroleum | Garen Ewbank Ewbank Geo Testing | Neal Jones Jones Studio Architects | Ed Stokes Stokes International Consultancy, LLC |
| Shay Braun Treehouse Foods | Jeff Fisher Ascent Resources | Jaime McAlpine Chermac Energy Corporation | Paul Tikalsky Oklahoma State University |
| Mark Brewer Independent Consultant | Jim Hasenbeck Studio Architecture | Bob Milam Eagle Claw Midstream | Rick Webb Webb Consulting Group |
| Larry Bryce Kohler Co. | Steve Huckaby Meritage Midstream | Ann Oglesby Phillips66 | |
| Mike Carolina OCAST | Jeff Hume Continental Resources, Inc. | Bill Remy TBM Consulting Group | |

CEAT ADMINISTRATION

| | | | | |
|----------------------------------|--|---|---|--|
| Dr. Paul Tikalsky Dean | Randy Seitsinger Associate Dean, Academic Affairs | Dr. Chuck Bunting Associate Dean, Research | Ed Kirtley Assistant Dean, Engineering Extension | Dr. Raman Singh Associate Dean, Helmerich Research Center Director |
|----------------------------------|--|---|---|--|

CEAT ACADEMIC HEADS

| | | |
|---|---|---|
| Suzanne Bilbeisi Architecture Engineering | Dr. Norb Delatte Civil and Environmental Engineering | Dr. Sunderesh Heragu Industrial Engineering and Management Engineering and Technology Management |
| Dr. John Veenstra Biosystems and Agricultural Engineering | Dr. Young Chang Division of Engineering Technology | Dr. Raman Singh Material Science and Engineering |
| Dr. Rob Whiteley Chemical Engineering | Dr. Jeffrey Young Electrical and Computer Engineering | Dr. Dan Fisher Mechanical and Aerospace Engineering |

CEAT EXTENSION HEADS

| | | |
|--|---|--|
| Gary Snyder Center for Local Government Technology | Ed Kirtley International Fire Service Accreditation Congress | Dr. Robert Taylor New Product Development Center |
| Craig Hannan Fire Protection Publications | Erin Portman International Ground Source Heat Pump Association | Clayton Moorman Professional Development |
| Dr. Erick Reynolds Fire Service Training | Michael Hinkston Local Technical Assistance Program | |

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