

OKLAHOMA STATE UNIVERSITY
COLLEGE OF ENGINEERING, ARCHITECTURE AND TECHNOLOGY



2014-2018
STRATEGIC PLAN



COLLEGE OF ENGINEERING, ARCHITECTURE & TECHNOLOGY

STRATEGIC PLAN

2014-2018

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PREAMBLE

The College of Engineering, Architecture and Technology at Oklahoma State University was formed more than 110 years ago to provide a practical education “related to agriculture and the mechanic arts” to help the State of Oklahoma grow. Many of the State’s leading engineering and architecture companies were founded by former students and the economy of the Southern Plains was built on the innovation and design skills of its graduates.

The programs at Oklahoma State University have more than doubled in size in the past decade and the demand for its graduates far outpaces its capacity to create top level engineers, architects and technology leaders.

COLLEGE OF ENGINEERING,
ARCHITECTURE & TECHNOLOGY

OKLAHOMA STATE UNIVERSITY
2014-2018



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 population with a quality education in engineering, architecture and technology. OSU develops ethical leaders that promote economic and community vitality with technical knowledge, innovation, and communication expertise that connects scientific research, professional education, technical assistance and scholarship to industry, 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 that is transforming our lives. 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 professionals that innovate, design and build projects that provide solutions for both the developed and the developing world.

The mission of the College of Engineering, Architecture and Technology (CEAT) is one that embraces students from diverse backgrounds to imagine and discover the challenges of engineering, architecture and technology, and to bring about innovation using their proficiency in science, mathematics, communications, ethics and humanity. This mission is built on the foundation of the University's mission and the expectations of a world class university.

As Oklahoma's land-grant university, CEAT fulfills the most fundamental premise that founded OSU; to promote economic and community viability through technical assistance, academic and professional education, training and communication in the areas of engineering, architecture and technology, and by connecting scientific research and scholarship to industry, communities, and individual citizens in Oklahoma, the region and the world.

THE VISION AND MISSION of the College of Engineering, Architecture and Technology emphasizes our students and the obligation to create future designers and leaders in professions grounded in ethics, innovation and a sustainable world.

The 5-year strategic plan is developed to guide the College of Engineering, Architecture and Technology in decisions and to lay out future directions. The strategic plan assists the College of Engineering, Architecture and Technology in improving our performance by defining both the direction and metrics by which progress is measured. It is neither policy or doctrine, but the principles by which the College defines its direction and aspirations to continuously improve and stay among the very best programs in the nation.

The faculty in CEAT at Oklahoma State University is at the very core of the higher education and engineering research in Oklahoma. As the Land-Grant University in the state of Oklahoma, OSU's College of Engineering, Architecture and Technology creates engineers, architects, managers, and leaders for engineering, design, energy, and construction firms throughout the nation.



“Without continual growth and progress, such words as improvement, achievement, and success have no meaning” -
Benjamin Franklin

GOALS AND OBJECTIVES

The goals of the College of Engineering, Architecture and Technology at Oklahoma State University are developed to help the faculty, staff and administration achieve the College’s mission. Each goal 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 five major goals for the Department in this strategic plan

- I. ACADEMIC GOAL
- II. RESEARCH GOAL
- III. COMMUNITY GOAL
- IV. FACILITY GOAL
- V. OUTREACH AND EXTENSION GOAL



ACADEMIC GOAL: Recruit and retain the diverse intellectual talent needed throughout Oklahoma and the nation, and graduate these students with a world class education to address the engineering and design challenges of the 21st century.

This goal addresses the 5-10 year needs of the State of Oklahoma and the region's many employers that require technically skilled people to grow, maintain and innovate in their companies. With changing demographics in the region, it will require OSU to focus on admitting qualified students and providing a means for them to succeed in their degree program.

STRATEGIES FOR ACADEMIC GOAL

- Work with Mathematics, Chemistry and Physics departments to improve the student learning in fundamental classes.
- Provide scholarships to reduce the time students need to work during the school year to graduate in 4.5 years.
- Expand the Summer Bridge program to assist disadvantaged students in preparing for the fall semester and to assist multicultural students in better acclimating to the college environment.
- Create an environment within CEAT where students can study, learn, and mentor each other to succeed in their education.

METRICS FOR ACADEMIC GOAL

- Retain more than 85% of all freshman to the sophomore year at OSU.
- Graduate 600 CEAT undergraduates per year, which represents less than the expected demand, but more than existing resources can provide.
- Graduate more than 70% of the incoming freshman within 4 years of entering CEAT.
- Create the capacity for 200 students a year to participate in a global engineering/architecture experience.
- Be considered among the top 50 public U.S. academic programs in engineering, architecture and technology.
- Provide a complete educational experience with 200 full-time tenure track faculty with specialized expertise.
- Advance pedagogy in both undergraduate and graduate engineering education to keep ahead of rapidly advancing technology.



RESEARCH GOAL: Support an advanced research enterprise that engages faculty and students in funded federal, state, and industry based innovation.

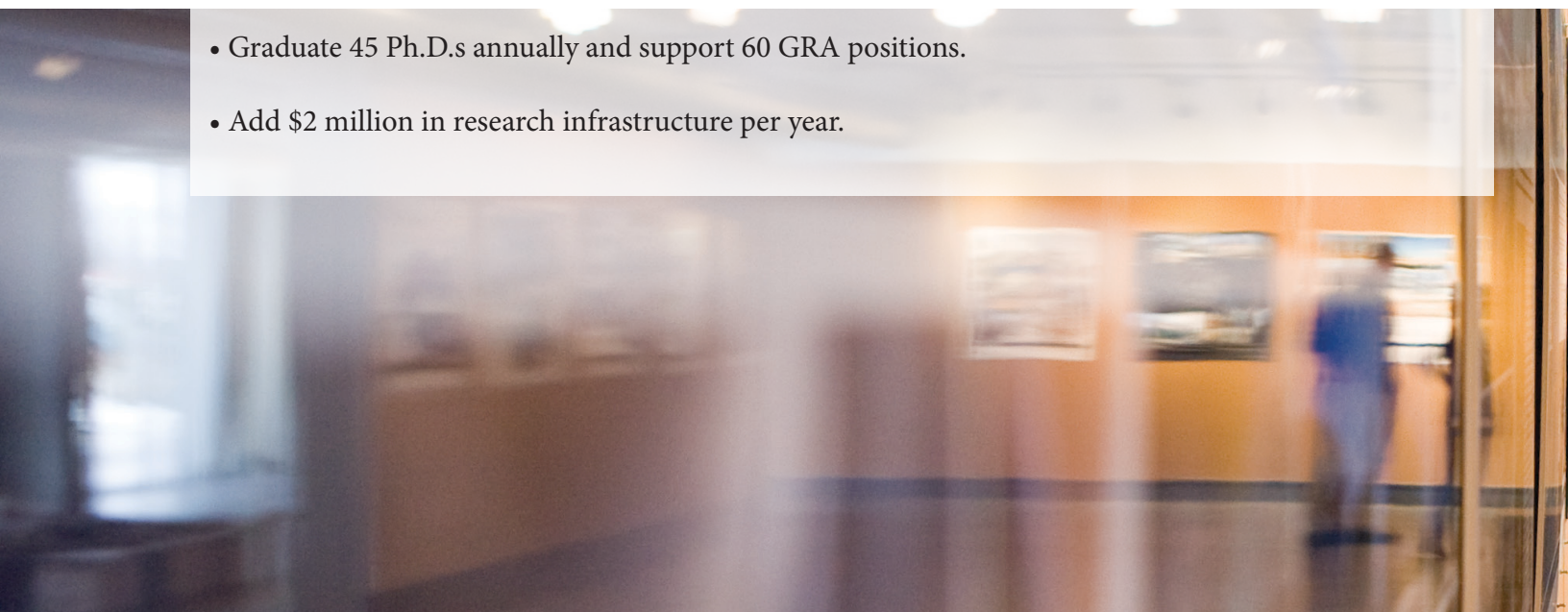
This goal addresses the 5-10 year needs of CEAT to mentor our students in innovation and provide intellectual capital to the economy of Oklahoma and beyond. As a major public research institution, OSU has the mandate to help develop sustainable enterprises that improve the economy through innovation,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

STRATEGIES FOR RESEARCH GOAL

- Provide services in proposal writing, RFP responses, budgeting, and administrative support to permit faculty to compete for federal, state and industrial research funding.
- Invest in research infrastructure in strategic areas where CEAT research is developing and expanding.
- Expand the faculty roles to allow all faculty to engage in research and scholarly activity.
- Recruit high quality graduate students to work on research and innovation for our research clients.
- Create incentives for faculty for outstanding research efforts.

METRICS FOR RESEARCH GOAL

- Hire 25 faculty specifically to address the need to have faculty to write proposals, execute research, innovate and pursue entrepreneurial activities.
- Recruit 50% of new graduate students with a GPA above 3.5 from US institutions.
- Be recognized as one of the top 100 US engineering research programs, as measured by NRC, USNEWS, NSF, ASEE.
- Conduct \$40 million in research expenditures annually by tenure track and research faculty.
- Graduate 45 Ph.D.s annually and support 60 GRA positions.
- Add \$2 million in research infrastructure per year.



COMMUNITY GOAL: Develop an atmosphere where students work together to encourage teamwork, communication, business, diversity, leadership, professional development, and ethical standards.

STRATEGIES FOR COMMUNITY GOAL

- Provide a physical and mentoring atmosphere in CEAT that encourages students to help each other succeed.
- Provide real-time advising that allows students to meet with both advisors and faculty to assist them in making curriculum decisions.
- Provide a modern IT environment that allows students to develop communication skills, data sharing, and integrated project delivery for class projects and senior design.
- Improve the collegiality across disciplines and emphasize diverse teams that facilitate innovation.

METRICS FOR COMMUNITY GOAL

- Develop a student excellence center that becomes the hub of daytime activities, studying and after hours activities that enrich the student experience.
- Provide 1 professional advisor for every 200 students and every 12 faculty.
- Provide access to facilities that allow students to develop team projects and prototyping ideas.



FACILITY GOAL: Address the aging infrastructure and need for additional space related to growth of the college.

STRATEGIES FOR FACILITIES GOAL

- Develop and construct a new Student Excellence Center for advising, mentoring, multicultural programs, and common space for CEAT students.
- Renovate existing buildings and develop new facilities to accommodate the growth in faculty and students for the academic mission of CEAT.
- Develop and construct a new integrated undergraduate lab building to allow faculty to teach 21st century hands-on concepts to students.
- Work with the University to relocate technology and Civil and Environmental Engineering (CIVE) labs to new facilities if Cordell Building or the Engineering South Annex are removed.

METRICS FOR FACILITIES GOAL

- Develop and construct a Student Excellence Center in the 1st Floor of the Advanced Technology Research Center (ATRC).
- Renovate Engineering North to fully accommodate the faculty of Chemical & Petroleum Engineering, Mechanical and Aerospace Engineering, Industrial Engineering and Distance Education.
- Renovate Engineering South to fully accommodate the faculty of Civil & Environmental Engineering, Electrical & Computer Engineering, CEAT Student Organizations, and Classrooms.



OUTREACH AND EXTENSION GOAL: Promulgate knowledge and skills in engineering, architecture and technology to citizens, government and industry in Oklahoma and beyond through engaging outreach and extension programs and services.

STRATEGIES FOR OUTREACH AND EXTENSION GOAL

- Develop awareness of outreach and extension mission and programs amongst staff, faculty and OSU leadership.
- Implement a business model for outreach and extension units that ensures financial and program sustainability, is manageable and flexible, and supports mission success.
- Engage faculty in cooperative programs that meet the land-grant mission of research, scholarship and outreach.
- Improve administrative efficiency by streamlining operations, processes and procedures.

METRICS FOR OUTREACH AND EXTENSION GOAL

- Establish a training protocol so that all existing faculty are made aware of the Outreach and Extension mission, programs, and services within the next year, and that all new faculty share that awareness within 90 days of beginning employment.
- Increase the number of undergraduate students participating in outreach activities so that 100 students are participating by the third year of the program.
- Market outreach program accomplishments and impacts to the college, alumni, stakeholders and citizens, starting with an annual report and periodic newsletters and video reports.
- Implement uniform and sustainable financial and managerial operating procedures across all Outreach and Extension units.
- Recruit and engage at least 10 faculty each year in cooperative/multi-disciplinary research, outreach and extension initiatives.

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COLLEGE OF ENGINEERING, ARCHITECTURE & TECHNOLOGY

ARCHITECTURE

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THE SCHOOL OF ARCHITECTURE AT OKLAHOMA STATE UNIVERSITY

has enjoyed a 104-year history as part of a significant land-grant university. Today, the School is proud of its innovative faculty, supportive staff, hard-working and talented students, and state of the art facility which was finished in 2009. The School is nationally respected as a professionally-oriented program offering undergraduate degrees in architecture and architectural engineering. The relationship of the School to the College of Engineering, Architecture, and Technology is unique and supports the strong and symbiotic relationship between faculty and students in architecture and architectural engineering. We believe this strong relationship between our programs is key to the success of OSU School of Architecture graduates, many of whom have enjoyed great success in the practice of architecture and architectural engineering in Oklahoma, the United States, and world. The School of Architecture graduates an average of 41 graduates per year over the last 5 years. These graduates have been sought after in these professions, even during difficult construction climates of the last 5 years. This has allowed a high rate of success in securing jobs in industry.

The School of Architecture faculty is key to the School's success. The faculty is diverse in background and methodology but all support the School's mission and contribute to its welfare and growth. Faculty members are expected to participate and excel in the areas of teaching, scholarship and creative activities, and service. The School places great value on collaboration and collegiality, and the faculty team-teach all of the design studios in the curriculum. While each faculty member engages in research and service differently, teaching excellence is expected of all faculty members.

The areas of scholarly and creative activity recommended to the School of Architecture faculty are broad, as long as a clear link to the mission of the school can be demonstrated. The school's professional orientation and the strong emphasis on teaching make scholarship and creative activities that address such areas especially valued. Scholarship and creative activities add knowledge and value to the profession and also enhance the faculty member's body of professional knowledge and teaching abilities. The professional practice of architecture or architectural engineering can be a significant venue for scholarship and creative activity of a faculty member, as the professional focus of the programs demands a faculty member knowledgeable and current in the process of creating architecture. Participation in professional-level design competitions can also be a vital means of exploring architectural issues as a creative activity.

Faculty members are further expected to provide service to relevant professional organizations or serve as consultants to other governing bodies or community organizations in which expertise in architecture or architectural engineering is a valuable contribution. Faculty may be active in school, college and university service through committee work, cross-campus or interdisciplinary collaborations, student advising, or student organization sponsorship.

MISSION

The mission of the School of Architecture is to prepare future architects and architectural engineers to make vital contributions to humanity through the creation of architecture.

VISION

The School of Architecture's vision is to be nationally recognized for outstanding professionally focused programs in architecture and architectural engineering with strengths in design and the collaboration between architecture and architectural engineering.



ACADEMIC GOAL: Provide outstanding professionally focused programs in architecture and architectural engineering.

This goal addresses the 5-10 year needs of the School of Architecture to provide the state of Oklahoma and the nation leaders for the continuing growth and development of a viable and sustainably built environment.

STRATEGIES FOR ACADEMIC GOAL

- Maintain quality, accredited, professional programs in architecture and architectural engineering that also foster the integration between academia and the profession.
- Initiate graduate programs in architecture and architectural engineering.
- Initiate curriculum and program innovations to support the professional focus of programs.
- Initiate internship and mentoring opportunities/programs.
- Use the DWR Endowment to strategically enhance the facility to continuously provide faculty and students a state of the art environment for education and scholarship.

METRICS FOR ACADEMIC GOAL

- Consistently score above 70 percentile in ongoing assessment of “communication”, “problem-solving” and “design skills” as articulated in the School’s Assessment plan.
- Graduate programs initiated with enrolled students.
- Graduates score above the national average in all categories of the ARE, FE, and PE exams.
- At least one student each year receives national recognition in design competitions.
- The digital fabrication lab has been fully installed with adequate staff support and integrated within the curriculum.



FACULTY GOAL: Nurture and reward outstanding faculty with a focus on teaching excellence, scholarship and creative activities, community and professional engagement, and collaboration.

An outstanding faculty team is the core of any highly successful architecture program. This goal addresses the 5-10 year needs of the School of Architecture to prepare, support, and retain an innovative and productive faculty recognized for teaching and scholarly excellence.

STRATEGIES FOR FACULTY GOAL

- Provide faculty excellent mentorship to facilitate success in teaching and scholarship.
- Initiate and support programs and opportunities for ongoing faculty development.
- Encourage interdisciplinary research and scholarship initiatives with allied programs and professionals.

METRICS FOR FACULTY GOAL

- On average, at least one faculty member each year receives a teaching award from OSU, the state or the region and at least 3 of the faculty members have been recognized with a significant national award or leadership in a national organization during the previous five years.
- 100% of faculty is engaged in significant scholarly activities.
- Faculty salaries, averaged by rank, are above the Big 12 average.
- At least one significant research or scholarly collaborative relationship is carried out with an allied OSU department each year.



STUDENT GOAL: Recruit, retain, inspire, and educate students who have the ability and commitment to enrich society in an atmosphere that encourages creativity, diversity, academic success, collaboration, and leadership.

This goal addresses the 5-10 year needs of the School of Architecture to recruit, educate, and graduate well-rounded, creative, and innovative students who will lead in solving tomorrow's problems relating to a sustainable built environment.

STRATEGIES FOR STUDENT GOAL

- Develop and implement a plan to recruit and admit highly qualified students from Oklahoma and beyond to the School of Architecture with a goal of increasing academic excellence and diversity.
- Develop and implement a plan for increasing retention while managing enrollment and resources for effective faculty/student ratios and encouraging academic excellence.
- Initiate and support enrichment programs and interdisciplinary collaborations that enhance student learning and leadership development.
- Develop and implement marketing initiatives to increase the school's visibility.

METRICS FOR STUDENT GOAL

- Increase student retention by 25%.
- 75% of students take part in a long-term study-abroad experience.
- At least one significant academic collaborative relationship is formed with an allied OSU department each year.
- Regular dissemination of SOA news and successes through the website, social media, annual newsletter, email, and the ACSA newsletter.
- Reach 40% female student population, increase the diversity of the student population, and increase the percentage of international students.
- Provide at least \$150,000/year in scholarships, stipends, and awards to School of Architecture students.



OUTREACH GOAL: Provide meaningful initiatives that improve the built environment in Oklahoma communities and beyond and provide enriching engagement with professional communities.

This goal addresses the 5-10 year needs of the School of Architecture to provide the citizens of Oklahoma and professional architects and architectural engineers direct value by providing applied research and educational opportunities that will enrich society.

STRATEGIES FOR OUTREACH GOAL

- Develop programs and projects that have a direct impact on the enhancement of the built environment in Oklahoma.
- Offer continuing education programs for professional architects and engineers.
- Encourage increased engagement in leadership activities by faculty in professional organizations.

METRICS FOR OUTREACH GOAL

- At least 3 professionally-focused community service projects per year.
- At least 40% of faculty members have served in leadership positions in professional organizations in previous five years.
- At least 5 continuing education programs for the profession each year.
- Host at least one regional or national professional society conference over the next 5 years.

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BIOSYSTEMS & AG ENGINEERING

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BIOSYSTEMS AND AGRICULTURAL ENGINEERING AT OKLAHOMA STATE

UNIVERSITY enhances the production and profitability of agricultural and biological products and the conservation and management of natural resources through teaching, research and outreach.

Biosystems and Agricultural Engineering programs expect to be focused on areas of importance to the Division of Agricultural Sciences and Natural Resources, the College of Engineering, Architecture, and Technology, and Oklahoma State University. Within the Oklahoma State University Spires of Excellence, the BAE department expects to specifically address the spires tied to: enhancing food production and safety, solutions-inspired energy research, sustainable solutions for water resources development and management, animal health and well-being, human and environmental safety, and advanced material infrastructure.

Within the OSU priorities for action from the OSU strategic plan, BAE programs will be addressing faculty and staff excellence in research, teaching and extension programs; improving academic performance through teaching, advising and mentoring; embracing sustainability; promoting inclusiveness and diversity, and promoting programs through improved communication initiatives.

MISSION

The Biosystems and Agricultural Engineering Department enhances the production and profitability of agricultural and biological products and the conservation and management of natural resources through teaching, research and outreach.

VISION

The Biosystems and Agricultural Engineering Department will be recognized nationally and internationally as a program of excellence in the application of engineering to biological systems, agricultural production and processing, natural resources management, and rural development.

In the tradition of the American land-grant system we will:

- Provide a sound, comprehensive education that prepares students to serve society as professional engineers.
- Conduct fundamental and applied research that makes a positive impact upon Oklahoma, the nation, and the world.
- Extend the University to all Oklahoma citizens, both urban and rural, to improve the quality of life, increase the profitability and sustainability of agriculture, and protect the environment.



ACADEMIC GOAL: Provide excellent academic and professional continuing education programs that are relevant, state-of-the-art, and can meet or exceed clientele expectations.

METRICS FOR ACADEMIC GOAL

- Undergraduate enrollment of at least 150 students
- Student retention through graduation at a percentage exceeding that for all OSU engineering students.
- 60% of B.S. graduates having internship, co-op study, or other engineering work experience.
- 60% of B.S. graduates having involvement in professional society activities.
- 80% of B.S. graduates taking the Fundamentals of Engineering exam prior to graduation.
- 80% pass rate for those students taking the Fundamentals of Engineering exam.
- Established core of at least 20 students within each undergraduate option.
- Average of 1 Wentz Research Scholar per year.
- Female undergraduate enrollment at a percentage exceeding that for all OSU engineering students.
- Undergraduate ethnic diversity comparable to that for all OSU engineering students.
- Enrollment of 2.5 graduate students per tenure-track research faculty FTE, with a majority in the Ph.D. category.
- 80% of graduate students presenting a professional paper prior to graduation.
- 100% of Ph.D. graduates gaining teaching experience prior to graduation.
- 80% of graduate students authoring a refereed publication within 2 years of graduation.
- Overall average instructor and course evaluations of 3.0 on a 4.0 scale (based on student surveys).
- 2 professional continuing education offerings per year.

RESEARCH GOAL: Develop technologies, processes, products, and strategies for more efficient and sustainable agricultural, food, biological, and natural resource systems.

METRICS FOR RESEARCH GOAL

- Average of 2.5 refereed publications per research faculty per year.
- Average of 3 professional papers and presentations per research faculty per year.
- Average of \$125,000 in annual grant and contract expenditures per research faculty.
- 100% of research faculty collaborating on multidisciplinary project teams.
- Firmly established relationship with at least 2 appropriate industries involved in processing of agricultural commodities.

OUTREACH AND EXTENSION GOAL: Enhance the economic vitality, natural resource base, and quality of life for Oklahoma's citizens.

METRICS FOR EXTENSION GOAL

- Average of 8 educational products per extension faculty per year.
- Average of \$75,000 in annual grant and contract expenditures per extension faculty.
- 100% of extension faculty collaborating on multidisciplinary project teams.



FACULTY GOAL: Recruit, retain, and develop faculty and staff who reflect diversity, possess appropriate expertise, and display outstanding productivity.

METRICS FOR FACULTY GOAL

- 20 tenure-track faculty.
- Pursue any special opportunities for recruiting women and ethnic minorities for faculty positions.
- Average of 0.5 FTE hard-funded support professionals per tenure-track faculty FTE
- 80% of eligible faculty registered as Professional Engineers.
- 75% of faculty providing service to national organizations (committees, conferences, etc.).
- 50% of faculty having been awarded national or international recognition.
- 75% of staff participating in a professional development activity each year.

RESOURCES GOAL: Provide the physical infrastructure and fiscal resources necessary to support programs of excellence in instruction, research and extension.

METRICS FOR RESOURCES GOAL

- Adequate office space to reasonably accommodate all faculty, staff, and graduate students.
- Average investment of \$100,000 annually in purchases of computers and other equipment eligible to be inventoried.
- Increase endowments and annual giving by 50% over 5 years.



PROGRAMS GOAL: Evolve specific programs over the next five years to specifically address economical bio-product development; enhance the mechanical system degree option and mechanization course alternatives; enhance our presence in water resource based research and extension programs; and significantly increase undergraduates choosing the food and bioprocessing option.

METRICS FOR PROGRAMS GOAL

- At least 10 new disclosures leading to patents, and licensing of viable bio-product process innovations.
- Top 10 university for primary employers seeking biomechanical graduates for employment and internships.
- Improved direct match between mechanization courses and certification requirements.
- Leadership on at least one new significant regional water resources improvement initiative.
- At least 10 food and bioprocess engineering undergraduates per year.



COLLEGE OF ENGINEERING, ARCHITECTURE & TECHNOLOGY

CHEMICAL ENGINEERING

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CHEMICAL ENGINEERING AT OKLAHOMA STATE UNIVERSITY is home to some of the university highest quality students, faculty and staff. There is no chemical engineering department in the United States that can document greater undergraduate student success than OSU. The OSU Chemical Engineering faculty are committed to scholarly excellence and are working to achieve the administration's goal to increase research expenditures.

Consistent with ABET terminology, "Educational Objectives" are the desirable attributes and accomplishments of OSU CHE B.S. graduates expressed during the first few years after graduation.

Most students seek private sector employment immediately after graduation. However, others enter professional schools (medical, law, or business) and some engineering graduate school. Some enter the military. It is common for some to leave professional practice and pursue a full-time commitment to raising a family. Regardless of the life path, there is a commonality in the activities, achievements, point of view, and style that lead to happiness and success in these after-graduation challenges.

After graduation, success is strongly dependent on personal commitment to the mission of the organization and independent learning. Contributions are most likely to occur when the new employee enjoys his situation, is enthused with the opportunities, is committed to the mission, and is comfortable enough with self and personal life to be free to work for others. Each organization will have identified desired attributes of employees, and these will be unique to the organization.

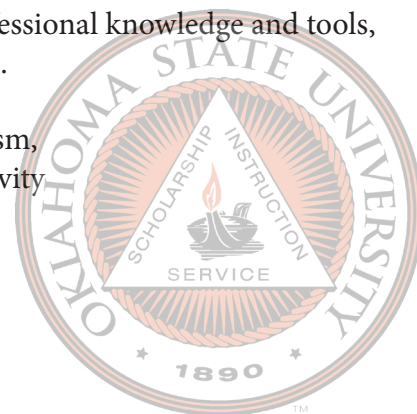
From this viewpoint our programs educational objectives desire that within the first few years after graduation, graduates from the School of Chemical Engineering at Oklahoma State University will be prepared for effective careers in chemical and related industries and will have the intellectual and social maturity to contribute to society.

MISSION

The mission of the School of Chemical Engineering at Oklahoma State University is to develop human resources, professional knowledge, and the infrastructure through which chemical engineering can contribute to human welfare. We expect to maintain national recognition for our contributions.

VISION

1. Sustain a nationally competitive undergraduate program recognized for quality, fundamental-practice balance, and educational leadership.
2. Attain widespread recognition for contributions to professional knowledge and tools, which are useful, widely accepted, and practiced by others.
3. Sustain and create infrastructures that facilitate synergism, creativity, personal and professional growth, and productivity by students and professional personnel both within OSU and the outside world.



GOALS: Maintain educational excellence and increase research productivity.
Leverage and collaborate with new programs and existing successes.
Focus on creating a strong foundation during the two-year staffing transition.
Develop individual plans that result in improved unit productivity.
Provide a direct link between performance and compensation.
Take advantage of the strong economy while the opportunity presents itself.

METRICS FOR GOALS

- Increase faculty size from 12 to 20.
- Award 60 B.S. degrees per year.
- Triple research productivity.
 - 30 combined M.S. & Ph.D.s per year.
 - 4 million \$ / year research expenditures.
 - Top 50 % NRC ranking by 2015.
 - Top 33 % NRC ranking by 2020.
- Utilize new seminar courses to address math skills, soft skills and improve retention.
- Create individual faculty plans to increase scholarly output.
- Implement method to reduce average time to graduation by 0.5 yrs for M.S. and Ph.D.
- Complete CHE office space remodel and expansion (essential).
- Revisit CHE grad program policies and procedures.
 - Grad student recruiting and stipends.
 - Incentivize reduction in time to graduation.
- Identify research collaboration opportunities and create multi-disciplinary centers for niche specialties.
 - Cement (in-progress).
 - Mid-stream, Water, Ethane/Propane, Drilling.
- Maximize hands-on/eyes-on experience in Petroleum courses.
- Leverage strong Petroleum Industrial Advisory Board with equal representation from national/multi-national and OK-based companies.
- Tenure-track staffing plans.
 - CHE: 2+ replacement; 1+ targeted growth.
 - PetE: 1 new (current search); 1+ possible growth.
- Create case for growing the Bio cluster to take recent success to the next level.
- Major shift in operating paradigm (practice -> research).
- Minimize impact of retirements and loss of 124+ years of experience.
 - Standardize instructional policies and procedures.
 - Implement formal mentoring program for new faculty.
 - Use Clinical Professors to provide industrial practice.

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COLLEGE OF ENGINEERING, ARCHITECTURE & TECHNOLOGY

CIVIL & ENVIRONMENTAL ENGINEERING

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CIVIL AND ENVIRONMENTAL ENGINEERING AT OKLAHOMA STATE

UNIVERSITY started in 1906. Civil and environmental engineers spend their careers dealing with infrastructure. As part of a Land-Grant institution, it is our job to provide education and public benefit to address state and national needs through education, research and outreach. Our products include trained engineers necessary for the design and maintenance of the state and nation's infrastructure, research into ways to maximize our current infrastructure and develop new infrastructure, and outreach activities to share our knowledge and training with the public to enhance their ability to contribute to the economy, environment and quality of life in our state and nation.

Today, the program is ranked 72nd out of 144 by U.S. News and World Report, and we believe there is a significant potential for CIVE to be ranked higher in the next quartile in the near future.

MISSION

The School of Civil and Environmental Engineering educates civil and environmental engineers with knowledge and skills for life-long careers and leadership; creates knowledge and technical breakthroughs that impact Oklahoma, the region and the world through innovative and creative research and scholarly activities; and shares knowledge through outreach activities.

VISION

The School of Civil and Environmental Engineering is recognized for its positive, meaningful and enduring impacts on humanity through its academic, research and outreach programs and for its respectful focus on students.



ACADEMIC GOAL I: Increase the number of B.S. degrees conferred by CIVE by 40% over current levels to an average of 50 per year by 2018.

In order to meet the needs for new and retiring civil and environmental engineers in Oklahoma and the region, CIVE needs to grow the number of program graduates above our current yearly average of 35 BS degrees. This will help to sustain growth in the number of faculty members and contribute to the research and outreach focus in CIVE.

ACTIONS FOR ACADEMIC GOAL I

To reach this goal CIVE needs to hire two new faculty members per year over the next five years. In addition to the numerous recruitment activities faculty already perform, recruiting could be increased by establishing a Summer Bridge Program with a civil engineering focus. This will help with retention of incoming at risk students (and perhaps other students as well) and also give them information about CIVE. One month of salary will need to be supplied to the faculty member or members leading the program. Also, the Dean will need to facilitate interactions between the school of CIVE and all freshman and sophomore engineering students. This will give CIVE an opportunity to show these students details about CIVE, give them hands on learning experiences, and show them the exciting career possibilities of CIVE.

ACADEMIC GOAL II: Increase the retention rate of undergraduates at OSU through increased engagement.

Improving retention is an important goal at OSU and one that CIVE wants to focus, CIVE has investigated the retention within the school and has found they have a 95% retention rate after students enter their junior year or professional school classes. This means that the majority of the loss of students occurs during the freshman and sophomore years. This needs to be a focus area for future efforts.

ACTIONS FOR ACADEMIC GOAL II

Increased engagement of students at the freshman and sophomore levels is critical. One way to engage students is to provide them funded undergraduate research activities within research labs. This gives the students meaningful research experiences that can help them appreciate how their education can be applied and it also helps the faculty in their research endeavors. Another benefit for undergraduates would be to have several CIVE-led field trips for freshman and sophomore students to visit large civil projects. These trips could be open to anyone interested and would provide first hand experiences. Both of these efforts could be arranged by the faculty but should not be expected to be funded by CIVE alone. Resources would be necessary to pay for large busses and drivers. Both of these programs would be an outstanding usage of funds given to the University to increase the number of engineering undergraduate degrees from OSU.

FACULTY GOAL: Promote faculty efforts to improve teaching quality.

Teaching is our fundamental mission at OSU. It is important to not lose sight of this and hence, we must create an atmosphere where high quality teaching is encouraged and supported.

ACTIONS FOR FACULTY GOAL

Several actions can be taken to further promote teaching quality within the School. A more structured mentoring program for young faculty with more experienced teachers should be created. Financial assistance and time should be provided to encourage faculty to attend the ASCE ExCEEEd teaching workshop or other educational development activities (e.g. ASEE). Financial support for improved classroom technology will be necessary, and as classroom technology improves, training opportunities to help faculty take full advantage of them should be found and financial support should be provided.

TEACHING GOAL: Continue our evaluation and refinement of the B.S. curriculum, laboratories, and educational experiences.

Changes in the profession require that curriculum change must be an ongoing process. The faculty will work towards modernization of our course offerings (laboratory experiences, computer experiences, co-op/intern experiences, and interdisciplinary/international experiences) while continuing to offer the strong fundamentals as advised by our Board of Visitors. CIVE currently has the highest pass rate on the Fundamentals of Engineering exam within CEAT and has an average pass rate well above the national average, as reported by NCEES. We plan to maintain this strength and continue to improve the educational experiences of our students, ensuring that they are well prepared to begin their careers.

ACTIONS FOR TEACHING GOAL

There is a plan to use any surplus of money available to refurbish teaching labs and provide educational technology to classrooms. There has been much discussion about internal competitions held within CEAT to obtain the funding necessary to refurbish teaching facilities. There should also be some additional money available to refurbish existing labs. Faculty will also focus on preparing proposals for external funding.



GRADUATE STUDENTS GOAL: Increase the number of MS and Ph.D. degrees conferred by CIVE to an average of 30 and 6 per year, respectively, by 2018.

CIVE needs to grow from the current average of 22 M.S. and 3 Ph.D. degrees conferred. Obtaining high quality Ph.D. students will improve the productivity of the faculty and help improve the impact and standing of CIVE.

ACTION FOR GRADUATE STUDENTS GOAL

One way to get high quality Ph.D.s is to pay them. A number of schools pay \$40K per year on top of their current stipend to get the best Ph.D.s. The faculty would like to have a set amount of money to provide very high level fellowships to high quality students. The School will seek at least \$250K per year for graduate stipends to keep more of the best students at OSU and to recruit high quality students from other schools. This money would be used on top of the current stipends paid by our research. This will help us obtain better graduate students and will help us improve the total number of graduate students as well.

OUTREACH GOAL: Enhance the School's dissemination of knowledge and research, by working with groups already existing at OSU, such as the Center for Local Government Technology (CLGT), to disseminate knowledge and research.

Implementation and dissemination of OSU research is critical to CIVE, CEAT, and the Land-Grant mission of OSU. There are a number of groups on campus that are better prepared to share this knowledge with the public and provide continuing education to professionals. current industry needs.

ACTION FOR OUTREACH GOAL

A series of meetings will be held between the CIVE faculty and CLGT (and other potential collaborators) to better understand how these groups can work together. An emphasis will be placed on finding simple methods of collaboration that will benefit both groups while not taking away from each other's missions or goals.

RESEARCH GOAL I: Enhance CIVE's reputation as a leader in CIVE research.

Recognition by peers as a leader in research has numerous benefits. CIVE faculty members and students will have a better chance of winning national awards, securing national research funding, occupying leadership positions in our professional societies as editors of journals, conference chairs, board members, etc.

ACTION FOR RESEARCH GOAL I

By increasing the number of PhD degrees, papers published in peer reviewed journals, and research expenditures, this will help raise the ranking of OSU in the eyes of peer institutions. If the other aspirational goals are accomplished then this goal will be met as well.

RESEARCH GOAL II: Increase annual research expenditures from competitive research grants by 20% to \$3 million by 2018 and remain the top school in CEAT on an expenditure/faculty basis while maintaining high quality education for our students.

Research expenditures from competitive research grants help to: develop CIVE faculty and provide summer salary support, recruit top doctoral and masters students, provide financial support and mentoring support so they can produce strong dissertations and theses, provide support for publishing high-quality articles published in peer-reviewed journals and conference proceedings, allow graduates to be placed in high-level academics civil and environmental positions to bring visibility to our graduate program, and fulfill our mission to provide public benefits in the area of infrastructure.

Despite small faculty numbers, CIVE has produced three or four of the top five funded researchers in CEAT for the last two years. By setting targets in faculty Professional Development Plans, coordinating research activities among faculty members in the School and other faculty at this university and others, CIVE will strive to increase our research expenditure, as a school, by 20% over the next five years. This will lead to a research expenditure level of \$3 million.

ACTION FOR RESEARCH GOAL II

Reaching \$3 million will require the school to recruit and retain several additional faculty members, with the objective of increasing the CIVE faculty numbers by a minimum of two faculty per year over the next five years. It is important that hires are made each year as a number of faculty members will be retiring in the next five years and the School does not want to be forced to add a number of faculty members quickly to a small department. This will also help us plan for our upcoming retirements. It is also important that equipment matching plans and continued renewal and updating of our research facilities continue.

As CIVE identifies strategic hiring needs within the School, it will work with associated Schools on campus such as Architecture, Biosystems, Chemical Engineering, Materials Science, Construction Management Technology, and Chemistry (all areas where we have past or ongoing collaborations) to determine the most appropriate strategic hires to support our six civil disciplines of construction engineering and project management, environmental, geotechnical, structural, transportation, and water resources.



COLLEGE OF ENGINEERING, ARCHITECTURE & TECHNOLOGY

ELECTRICAL & COMPUTER ENGINEERING

STRATEGIC PLAN 2014-2018



STRATEGIC PLAN 2014-2018

ELECTRICAL AND COMPUTER ENGINEERING AT OKLAHOMA STATE

UNIVERSITY plans to develop an outstanding, well-balanced faculty in instruction, scholarship and outreach.

STRATEGIES FOR INSTRUCTION

- Mentoring of newly hired faculty.
- Incorporate innovative educational techniques that promote problem-solving skills in the classroom and laboratories.
- Continual assessment and improvement of degree programs.
- Insure that students are properly advised at all levels.

METRICS FOR INSTRUCTION

- Competitiveness of graduates in securing employment.
- Admissions to graduate programs.
- Outcome of ABET accreditation reviews.
- Graduation rates and associated GPA.

STRATEGIES FOR SCHOLARSHIP

- Formation of focused research areas and strategic hiring of faculty in those areas that complement and enhance current capabilities.
- Mentoring of newly hired faculty.
- Promote faculty visitation and exchange opportunities.
- Encourage faculty summer programs.
- Increase extramural funding through appropriate, focused research proposals.

METRICS FOR SCHOLARSHIP

- Quantity and impact of scholarly output of faculty in terms of published papers in journals and peer reviewed conferences, text books, and patent disclosures using metrics such the h-index.
- Level of extramural funding to levels relative to peer institutions.
- Overall progress of younger faculty.

STRATEGIES FOR OUTREACH

- Aggressively publicize faculty and student successes.
- Develop research and instructional programs with external partners.
- Solicit potential naming contributions through most prominent graduates.
- Host professional meetings and conferences at regional up to international levels.
- Encourage faculty service to professional societies.
- Encourage formation and participation in student chapters of professional societies.
- Actively promote individuals (faculty, staff and students) for recognition and awards.
- Encourage visits and exchanges with peers and colleagues.

METRICS FOR OUTREACH

Count all successes: compare growth of endowment to previous years and peer institutions, and track number of invited papers, fellowships and professional services.

INDUSTRY GOAL: Serve the needs of area industry.

STRATEGIES FOR INDUSTRY GOAL

- Strategic hires in areas of Energy and Power Technologies.
- Further develop interdisciplinary work with MAE in unmanned autonomous systems.
- Involve local industry in Senior Design Laboratory courses.
- Incorporate feedback from School and College Board of Visitors.

METRICS FOR INDUSTRY GOAL

- Number of graduates hired by local industry.
- Project support and endowments from industry.
- Involvement with local industry development groups such as OCAST.

PROGRAMS GOAL: Improve national and international reputation of undergraduate and graduate degree programs.

STRATEGIES FOR INDUSTRY GOAL

- Increase number of Ph.D.s awarded.
- Improve ratio of M.S. thesis/non-thesis degree options.
- Add graduate degree programs (M.S. and Ph.D.) in Computer Engineering.
- Encourage graduate students to actively publish results in scientific journals and conferences.
- Develop international collaboration in research and instruction.
- Encourage study abroad.
- Assist students applying for fellowship and internship programs.

METRICS FOR INDUSTRY GOAL

- Number of graduate degrees awarded
- Number of graduates who take faculty, government laboratory, or research industry positions.
- Number of international scholars participating with ECE.
- Number of students entering graduate programs at other institutions.
- Number of students participating in international 2+2 university programs.
- Ranking of programs in publications such as US News.

STUDENTS GOAL: Recruit and admit the most qualified students.

STRATEGIES FOR STUDENTS GOAL

- Participate fully in college and university recruitment efforts.
- Provide adequate financial support to highly qualified students (scholarships, RA, TA).
- Identify funding for Ph.D. fellowships.
- Draw qualified students through the freshman research scholar program and other programs.
- Recruit nationally for top Ph.D. students.
- Outreach to high schools through programs such as ECE Design Day and OSU Up-Close.

METRICS FOR STUDENTS GOAL

- Graduation rates of students who enter program.
- GPA, GRE scores of students who complete program.
- Placement of graduates in industry or at graduate programs.
- Publication record of graduate students.

FACULTY GOAL: Develop ECE at OSU-Tulsa into a nationally competitive program.

STRATEGIES FOR STUDENTS GOAL

- Strategic hires in areas of emphasis at OSU-Tulsa.
- Appointment of an Associate/Assistant Head for Tulsa campus.
- Active recruiting of outstanding students in the Tulsa area.
- Coordination of advanced degree programs with Tulsa area industry.
- Increase availability of OSU-Tulsa course to non-traditional students.

METRICS FOR STUDENTS GOAL

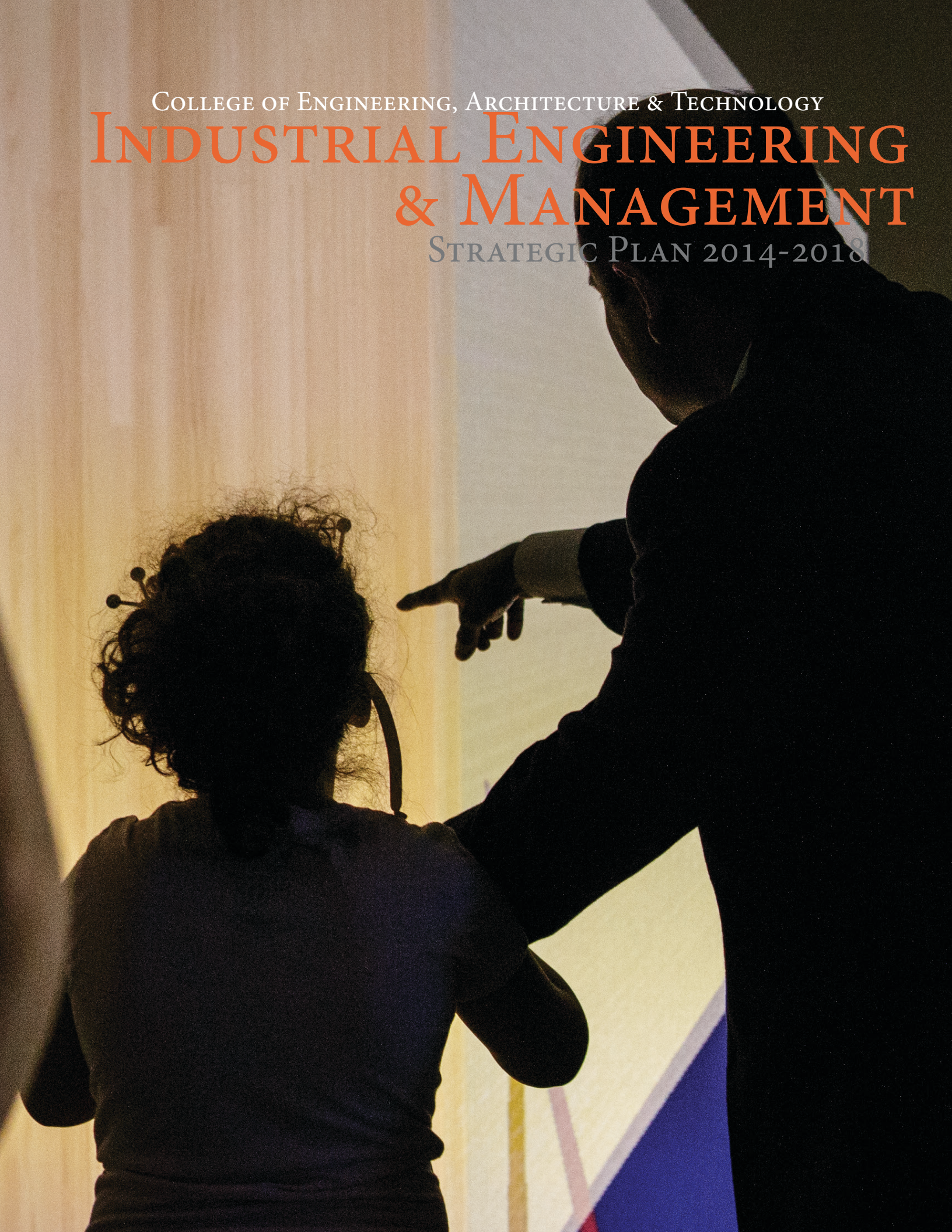
- Enrollment levels at OSU-Tulsa.
- GPA and graduation rates relative to Stillwater campus and peer institutions.
- Extramural funding of ECE-Tulsa faculty.
- Visibility of program relative to Stillwater campus and other institutions in OSU, State and national educational publications as well as popular press.
- Total number of graduate degrees awarded.



COLLEGE OF ENGINEERING, ARCHITECTURE & TECHNOLOGY

INDUSTRIAL ENGINEERING & MANAGEMENT

STRATEGIC PLAN 2014-2018



STRATEGIC PLAN 2014-2018

INDUSTRIAL ENGINEERING AND MANAGEMENT AT OKLAHOMA STATE

UNIVERSITY has a rich history and legacy. IEM at OSU granted its first IE degree in 1926, MS degree in 1948 and first Ph.D. in 1960.

This School has been represented and led by giants in Industrial Engineering – winners of the Institute of Industrial Engineers (IIE) highest award - Frank and Lillian Gilbreth award, members of the National Academy of Engineering, IIE Presidents, American Society for Quality (ASQ) and Association of Energy Engineers (AEE) Presidents, senior member of the Malcolm Baldrige National Quality award as well as IIE, AEE, American Production and Inventory Control Society (APICS) and ASQ Fellows. One of the first School Heads, H.G. Thuesen, co-invented the parking meter, the first of which was installed in Oklahoma City in 1935.

Today, IEM typically graduates about 25 B.S., 100 Masters (including the college-wide Engineering Technology Management program) and 2 Ph.D.s per year. The School has very active faculty who are well known by their peers for their engagement in the teaching, research and service missions of the School.

The School of Industrial Engineering and Management includes educators, researchers and citizens whose work has global reach and impact. It excels in preparing the next generation of leaders and professionals whose daily focus is on improving the efficiency and effectiveness of systems – manufacturing and service, for-profit and non-profit, public and private, national and international. IEM scholars excel at proposing and executing cutting edge research that strengthens organizations and impacts the lives of people served by these organizations. The School recognizes the vital role it plays in developing and providing opportunities today for individuals from diverse backgrounds with a keen interest in science, engineering and management to become successful leaders, entrepreneurs and professionals of tomorrow's organizations. To provide each graduate with the exciting and endless opportunities the industrial engineering discipline has to offer, IEM will develop ethical and professional engineers who use mathematics, science and engineering principles, have the ability to lead multi-disciplinary teams, can model and solve complex problems to design environmentally friendly and sustainable systems that have an economic impact and touch the lives of citizens throughout the world.

MISSION

To develop professionals and leaders in industrial engineering and management by being a leader in education, research, and outreach.

VISION

To place industrial engineers in a wide variety of industries including manufacturing, service, energy, healthcare, humanitarian and others, so that our society at large can benefit from systems that produce goods or services efficiently, use an optimal set of resources - physical and virtual, natural and man-made, effectively, and enrich the quality of life for all.

OVER-ARCHING GOAL

The School's goal is to become a named and endowed school ranked among the top twenty programs by 2020.



ACADEMIC GOAL: Educate and produce a new generation of IEM students proficient in theoretical, applied and technology relevant concepts and practices which will have a global reach and global impact while continuing to improve, monitor and enhance the student learning, recruiting, retention, advising, mentoring, internship and placement process.

In order to sustain a growth in the faculty, which itself helps increase our research activities and therefore our ranking, IEM must graduate an average of 40-60 B.S. students per year. An increase in the number of undergraduate degrees granted and in enrollment will allow us to develop a critical mass of students and offer an enriching curriculum, more technical electives, options to pursue co-op, internship and study abroad opportunities and broaden the scope of education for our students. This will facilitate the placement and growth of our graduates in for-profit and non-profit industries so that IEM graduates will be at the forefront of solving societal problems in manufacturing, service, energy, environment, entrepreneurship, new product and service development, logistics and the management of natural resources, helping them become successful professionals and leaders in IEM.

STRATEGIES FOR ACADEMIC GOAL

- Review and revise IEM curriculum at the B.S., M.S. and Ph.D. levels on-campus and online to make them current, relevant, engaging and challenging.
- Provide scholarships to allow students to pursue study-abroad opportunities, engage in co-op and internship activities (within or outside the US) and offer courses in sufficient frequency and breadth so a vast majority of our students can graduate in 5 years or less.
- Produce industrial engineers well versed in the ability to collect, process and utilize big data for real-time decision support.
- Produce industrial engineers who can develop or utilize new technologies, apply them in new areas and possess entrepreneurship skills and a sharp business acumen.
- Establish a one-stop shop for students that not only helps them navigate through student services, available campus resources and secure study-abroad, co-op, internship or career placements, but also allows IEM to closely monitor students for superior performance.

METRICS FOR ACADEMIC GOAL

- Graduate 40 IEM undergraduates per year by 2016 and 65 by 2018 in a wide variety of industries spanning from manufacturing to service, for profit and non-profit, public and private, national and international.
- Review and revise IEM curriculum at all three levels by 2016.
- Seek and secure ABET accreditation for B.S. and M.S. programs by 2017.
- Place 20 students each year in study-abroad, co-op and internship opportunities by 2017.

RESEARCH GOAL: Engage in cutting edge research of global importance to produce innovators and next generation education and societal leaders.

Seeking and securing competitive, extramurally funded research projects is a necessary pre-requisite to recruit and retain top-notch graduate students, who in turn can produce strong theses or dissertations under superior guidance, publish high-quality archival quality work, and find placements in high-level academic and industrial positions. This brings a high-level of visibility to the IEM program and its faculty. External research resources are critical in building a robust doctoral program with advanced curricula that furthers the placement and growth of our graduates in research organizations and universities so they can be at the forefront of developing new knowledge, training other industrial engineers and having a positive impact on society through their work.

STRATEGIES FOR RESEARCH GOAL

- Develop a culture that embraces extramurally funded research activities, making this activity the norm and not the exception.
- Identify opportunities and mentor new faculty to become successful in proposal writing, mentoring Ph.D. students and interacting with stakeholders.
- Invest in physical and cyber infrastructure to allow IEM faculty and graduate students to develop and expand research.
- Be recognized by our peers as a leader in research so our faculty and students will have a better chance of winning national awards, securing research funding, occupying leadership positions in our professional societies as editors of journals, conference chairs, board members and in other areas.

METRICS FOR RESEARCH GOAL

- Increase research expenditures from competitive grants to \$1.5 million and from all grants to \$4 million by 2016.
- Increase faculty size to 20 by 2020 to undertake leading-edge research and mentor next generation educators and entrepreneurs.
- Increase the number of annual Ph.D. graduates to eight by 2018.
- The number of Ph.D. graduates, journal papers published, external awards won and research expenditures must be within 25% of the top ten industrial engineering programs in the US by 2018.



OUTREACH GOAL: Actively engage in community projects, economic development and service for the greater good. Enhance IEM's image internally within CEAT and OSU and externally – the world at large.

A typical land-grant University receives its funding from student tuition, research and the state, and gives back by educating and placing students who become the next generation professionals and leaders who keep the economic engine running at peak efficiency within that state. At IEM, our goal is not only to give back in the long-run, but also in the short-run in novel and visible ways, both locally and internationally. Our goal is also to spruce-up IEM's image physically and metaphorically.

STRATEGIES FOR OUTREACH GOAL

- As a land-grant institution, seek to give back immediately and visibly by helping the broader community we serve benefit from the principles, tools and techniques of industrial engineering.
- Build top-notch educational and research programs to ensure IEM is always on the radar screen of OSU administration and external stakeholders and is recognized as the program with the potential to have a national spotlight.
- Actively seek to increase the endowment to attract top-notch faculty by offering endowed Chairs and faculty Professorships at the Assistant, Associate and Professor levels.
- Recruit and retain graduate students from around the world by offering competitive assistantships, scholarships and travel grants.
- Stake a claim in helping society use scarce resources in an economically viable and sustainable manner during normal times and help with humanitarian logistics during emergencies.

METRICS FOR OUTREACH GOAL

- Increase the School endowment from \$2 million to \$20 million by 2020.
- Be ranked among the top twenty programs in Industrial and Systems Engineering by 2020.
- Double the involvement in community outreach and humanitarian logistics by 2020.



STRATEGIC PLAN 2014-2018

The goals of the **SCHOOL OF INDUSTRIAL ENGINEERING AND MANAGEMENT AT OKLAHOMA STATE UNIVERSITY** are developed to help the faculty, staff and administration achieve the School's mission. Each of the goals 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 reach the goals and the administration to support the goals.

The 5-year strategic plan listed on the previous pages serves as a roadmap to guide the School of Industrial Engineering and Management as it embarks on an ambitious goal to be a named, endowed department ranked among the top twenty programs in the country.



COLLEGE OF ENGINEERING, ARCHITECTURE & TECHNOLOGY

MECHANICAL & AEROSPACE ENGINEERING

STRATEGIC PLAN 2014-2018



STRATEGIC PLAN 2014-2018

MECHANICAL AND AEROSPACE ENGINEERING AT OKLAHOMA STATE

UNIVERSITY was organized as Mechanical Engineering in 1923 with a faculty of three professors and a handful of students. Aeronautical engineering was first offered in 1928 and was fully accredited as a stand-alone curriculum in 1960; eight years later, the School was reorganized as Mechanical and Aerospace Engineering. Since then, the mechanical-aerospace bond has grown stronger each year, and today, it has forged an interdisciplinary program that is among the strongest in the nation. MAE is proud to continue in this fine tradition, forging high quality mechanical and aerospace engineers to drive forward the economic and scientific advancement of our state, our nation and our world.

The school envisions graduates who are prepared to lead intellectually, technically and ethically. It envisions graduates who are willing and ready to tackle the 'grand challenges' that face the world and who have the technical, interpersonal and leadership skills necessary to cast a vision and create innovative solutions to those challenges. It envisions graduates who both engage and advance their profession with integrity and excellence.

MAE creates, instructs and encourages. MAE creates knowledge through research and scholarly activities. It creates a learning environment in the classrooms and laboratories. It instructs through a variety of pedagogical methods and through mentoring relationships. And MAE encourages by word and deed. Its mission is to provide the environment, instruction and encouragement that will allow our students to excel in every area to the best of their ability.

The five-year strategic plan presented in this document is aligned with the original charter of the university, emphasizing the practice of engineering and the needs of Oklahoma. The School of Mechanical and Aerospace Engineering will continue to provide a broad engineering education grounded in fundamentals and advanced studies. Scholarship will continue to underpin learning, form the basis for outreach and contribute to the advancement of science and technology on a national and international scale. And outreach through technology transfer and engagement with the engineering and manufacturing sectors of the Oklahoma economy will continue to provide direction for both educational and research activities.

This five-year strategic plan establishes goals in four areas: undergraduate programs, graduate programs, research and facilities. The first two goals directly support our mission to 'instruct and encourage' our students. The research and facilities goals support our mission to 'create a vibrant and stimulating learning and research environment'. The specific goals are formulated with specific and measurable objectives that can realistically be achieved with the five year time frame of the strategic plan.

MISSION

Our Mission is to create a vibrant and stimulating learning and research environment and to instruct and encourage our students to reach their full potential in technical expertise, innovative expression, intellectual curiosity, and collaborative design.

VISION

Our faculty and staff prepare the next generation of mechanical and aerospace engineers to engage their profession with integrity and excellence in order to provide innovative solutions to the world's grand challenges.



UNDERGRADUATE PROGRAMS GOAL: Develop an undergraduate program that is recognized nationally for the strength of character, breadth of technical expertise and leadership abilities of our graduates.

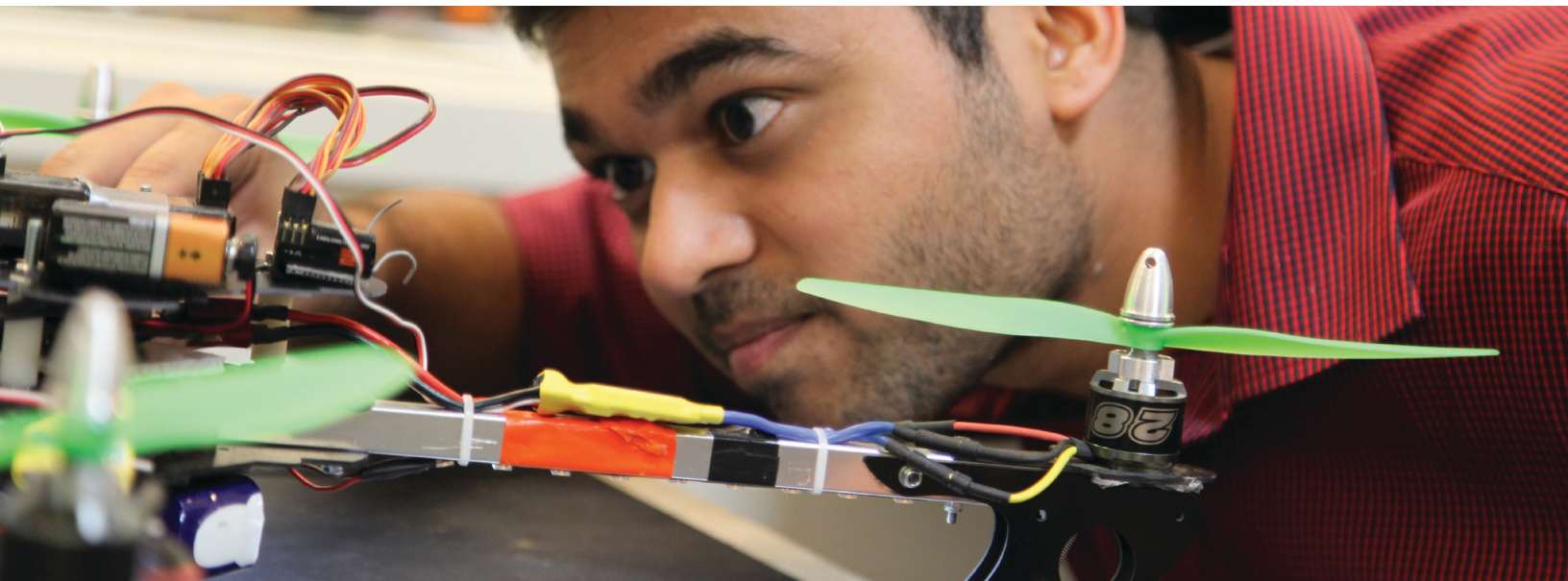
Increasingly, graduates of our program are expected to step into leadership roles that require excellent interpersonal communication and teamwork skills in addition to a fundamental knowledge of engineering science. This goal focuses on the needs of Oklahoma industry, the success of our graduates and peer recognition of our programs.

STRATEGIES FOR UNDERGRADUATE PROGRAMS GOAL

- Recruit high-talent faculty members who are excellent mentors and leaders and whose research interests are well-aligned with Oklahoma and national economic priorities.
- Overhaul the MAE curriculum to increase the number of course offerings and reduce class sizes in order to ensure that each student receives the instruction, advice, and engineering experience required to succeed.
- Identify and incorporate the latest technology and the best engineering education practices in MAE classrooms.
- Collaborate with the college to develop a summer program designed to improve retention of incoming freshman.
- Attend national engineering education conferences to calibrate our undergraduate program against national leaders in engineering education and to present MAE innovations in engineering education.

METRICS FOR UNDERGRADUATE PROGRAMS GOAL

- A faculty of over 35 tenure-track assistant, associate and full professors.
- A student faculty ratio of less than 20:1.
- Less than 25 students in 40% of MAE classes.
- Integrated web-based/hands-on learning techniques in all MAE taught engineering science classes.
- Five (5) national conference presentations on MAE engineering education in the next 5 years.



GRADUATE PROGRAM GOAL: Develop a graduate program that is well-aligned with the research needs of Oklahoma and the nation and is internationally recognized for the innovative and novel contributions of our graduates and for the intellectual rigor of their scholarly work.

Our success in preparing graduate students to address state and national research priorities depends on our ability to engage industrial partners in sponsored research and in our ability to recruit graduate students from US institutions. Our success in training and mentoring internationally recognized scholars depends on our ability to recruit talented Ph.D. students, rigorously train them through appropriate class offerings and research projects, and guide them in writing scholarly papers for conferences and peer-reviewed journals.

STRATEGIES FOR GRADUATE PROGRAMS GOAL

- Recruit high-talent tenure track faculty members who are excellent mentors and scholars, members of the graduate college, instructors in the MAE graduate curriculum and advisors of MAE graduate students.
- Raise additional support for incoming graduate student fellowships.
- Provide incentives for graduate students to publish scholarly conference and peer reviewed journal papers.
- Actively recruit students from top U.S. undergraduate programs.
- Develop a culture and environment where research and scholarship can thrive.
- Benchmark MAE graduate programs and policies against best practices of aspirational peer institutions.

METRICS FOR GRADUATE PROGRAMS GOAL

- A faculty of 35 tenure track faculty members who are excellent mentors and scholars, members of the graduate college, instructors in the MAE graduate curriculum and advisors of MAE graduate students.
- Develop a \$5M endowed fund for graduate student fellowships
- Raise \$100,000 in conference travel fellowships
- 75% of our incoming M.S. Students recruited from top U.S. Universities.
- Two sponsored graduate seminar series each academic year.
- Rank in top 75 ME graduate programs and top 40 AE programs in US News & World Report Survey.



OSU MECHANICAL AND AEROSPACE ENGINEERING

RESEARCH GOAL: Develop sustainable, collaborative and internationally recognized research areas that build on our core strengths and are well-aligned with the priorities of the nation and the State of Oklahoma.

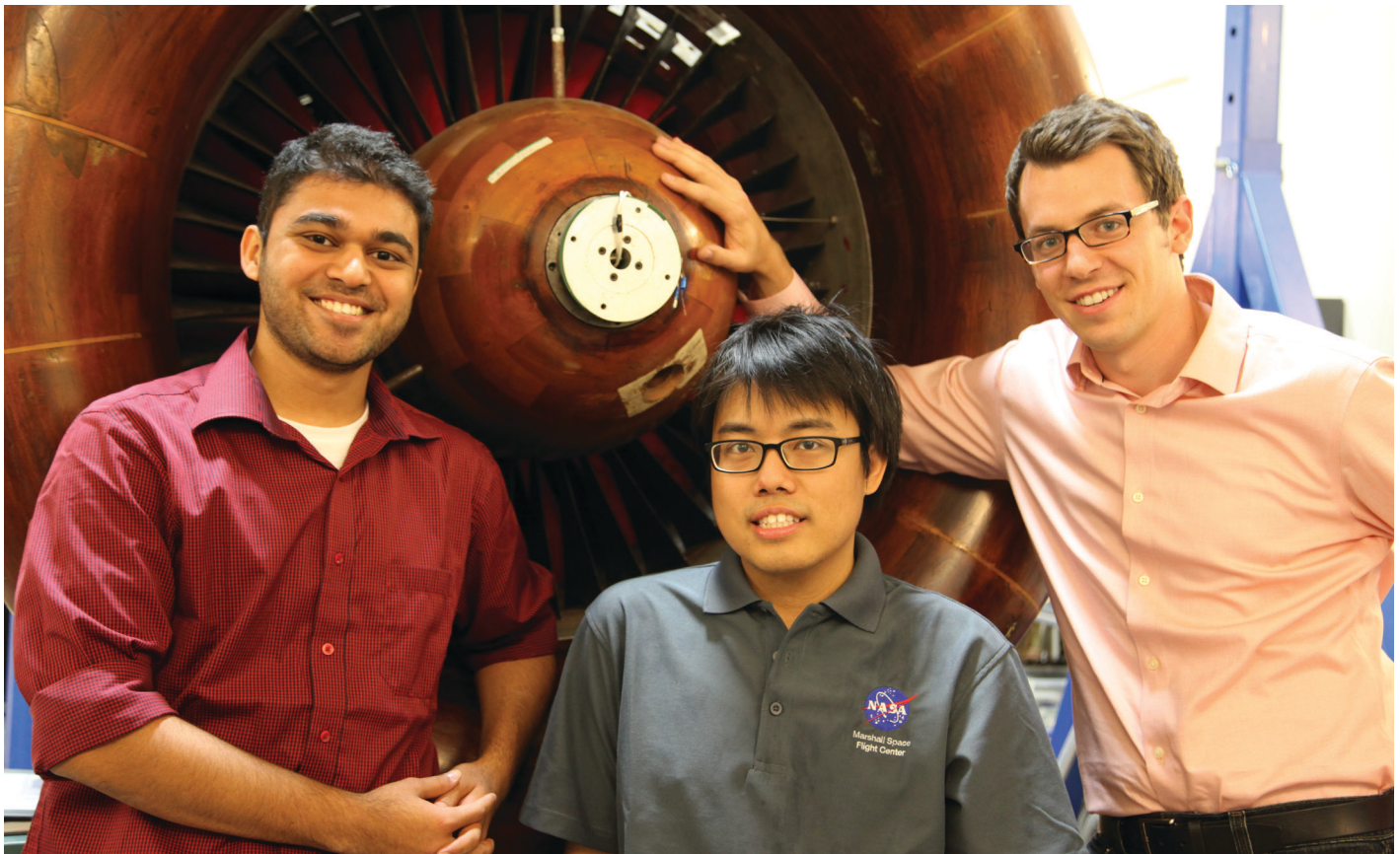
In the next five years we will focus on building research teams within MAE and developing collaborative relationships that reach across CEAT and beyond to industrial and academic research partners. We will build on our core strengths in energy, manufacturing and aerospace and seek to develop new focus areas that support national research priorities.

STRATEGIES FOR RESEARCH GOAL

- Strategically hire tenure track faculty to build core research groups.
- Balance faculty workloads to support research priorities.
- Improve quality and focus of research proposals.
- Develop technical support infrastructure for research activities.

METRICS FOR RESEARCH GOAL

- A faculty of 35 tenure-track, research-active members.
- A Ph.D. to M.S. advisee ratio of 2:1.
- 50% improvement in MAE proposal funding rate.
- Average research expenditures of \$200,000/tenure track faculty member.



FACILITY GOAL: Develop and maintain state-of-the-art classrooms, design studios, laboratories and offices to support the research and educational mission of our faculty and staff.

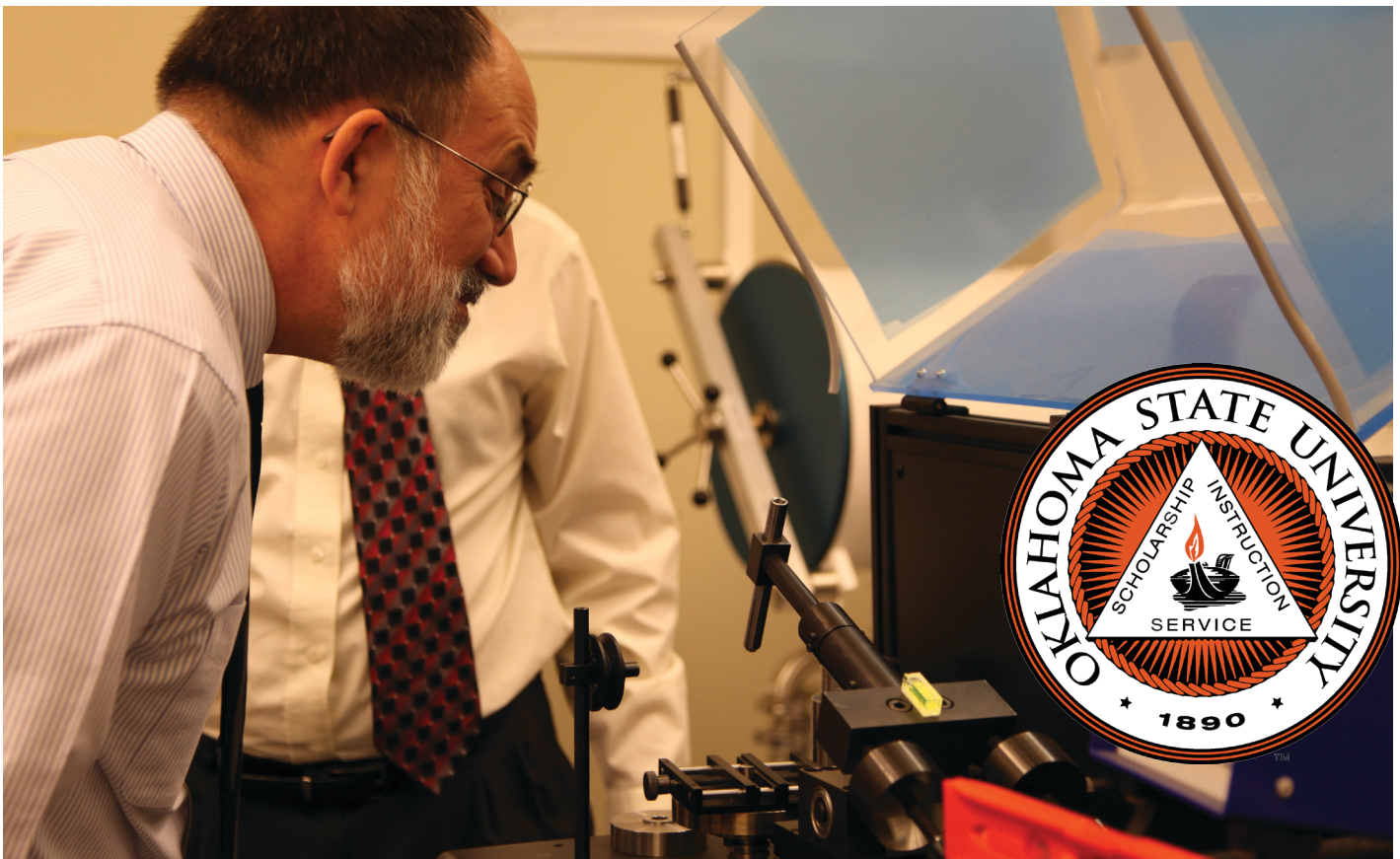
Our growing program will require additional office space for faculty and our transformative vision for undergraduate education will require new integrated learning laboratories for our undergraduate students. We will renovate existing facilities to improve space utilization and mission focus.

STRATEGIES FOR FACILITY GOAL

- Identify and develop new office space for growing MAE faculty.
- Develop state-of-the-art collaborative learning environment for MAE undergraduate research, laboratories, classes and competition teams.

METRICS FOR FACILITY GOAL

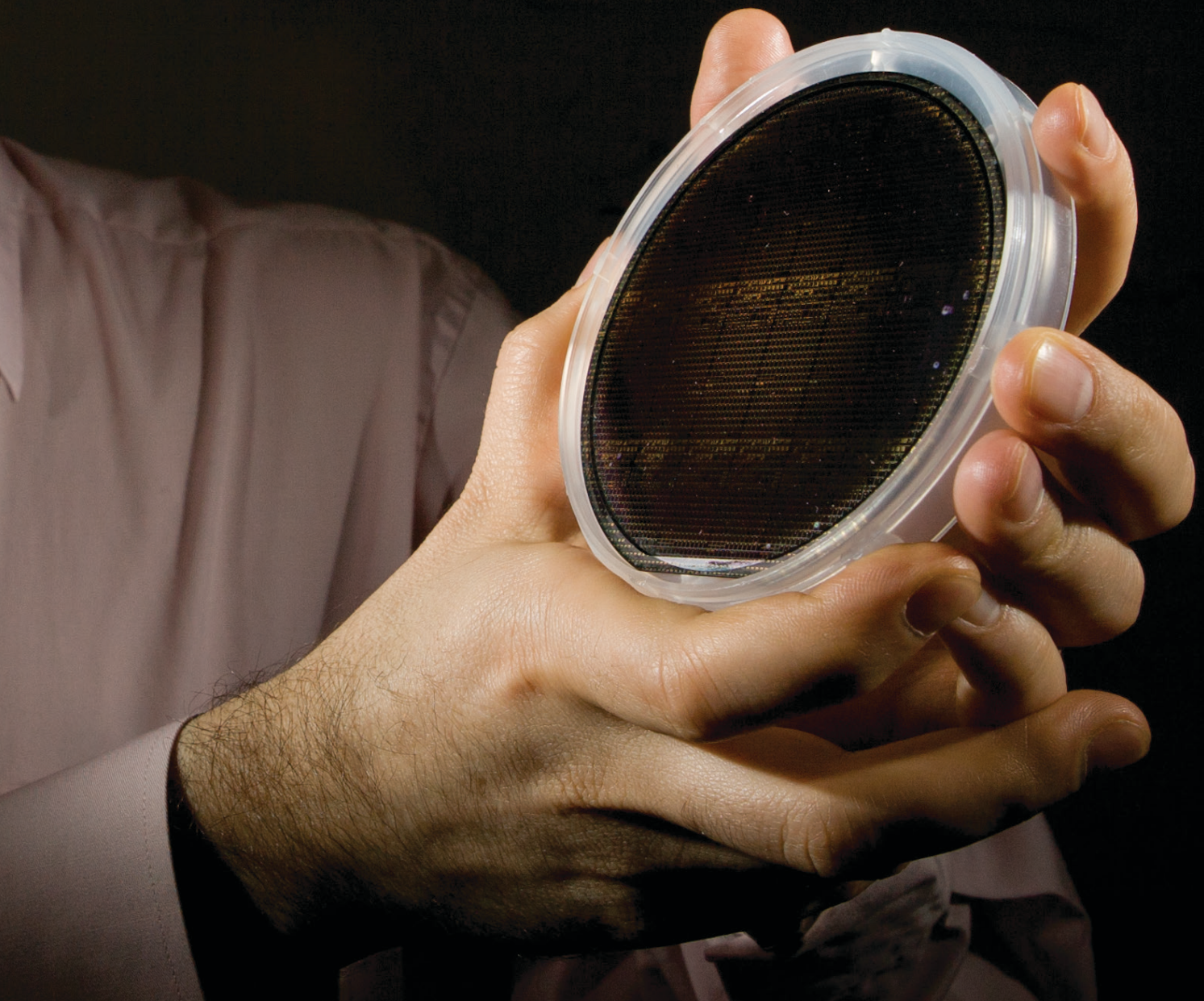
- Renovate Engineering North second floor to fully accommodate Mechanical and Aerospace Engineering faculty.
- Develop plans and raise \$2M for complete renovation of DML to create state-of-the art laboratory for MAE students.



COLLEGE OF ENGINEERING, ARCHITECTURE & TECHNOLOGY

MATERIALS SCIENCE & ENGINEERING

STRATEGIC PLAN 2014-2018



STRATEGIC PLAN 2014-2018

MATERIALS SCIENCE AND ENGINEERING AT OKLAHOMA STATE UNIVERSITY

was started in 2012. It is located at OSU-Tulsa's Helmerich Research Center, a premier facility that was created to fulfill the commitment made to the citizens of Tulsa for Vision 2025. The School of Materials Science and Engineering graduate program at Oklahoma State University was approved in Fall 2013, which places the College of Engineering, Architecture and Technology (CEAT) in a unique position to conduct world-class education, research and technology development in advanced materials of strategic importance to our nation. It supports Oklahoma's key industries, develops new industries, contributes to national defense, and provides well-trained professionals to lead our businesses and communities.

One of the guiding principles of the Materials Science and Engineering program is to demonstrate that job creation can be a priority of a university research facility while at the same time preparing the U.S. workforce that can create prosperity through materials discoveries in the twenty-first century. The graduate program in Materials Science and Engineering is already contributing towards materials based innovations in aerospace, energy and biotechnology. It is expected that the demand for its services and its graduates will outpace its capacity to create top-level engineering talent pool for Tulsa, the State of Oklahoma and Midwest USA.

The graduate program in MSE at OSU is established to train our next generations to design materials for specialized uses, making materials reliable and useful to mankind. It fits with OSU's Land-Grant mission and the CEAT vision by providing training in an underserved area of Materials Science and Engineering. The graduate degree is providing opportunities for training in research and technology development in advanced materials to act as a catalyst for the long-term economic viability of the surrounding region. The proposed program is also promoting teaching and research focused on specific advanced technologies such as advanced materials for energy, aerospace, medicine, and electronics. It is also promoting research and technology development associated with creating new products and processes leading to new enterprises in Northeast Oklahoma, as well as promoting knowledge and information exchange through partnership with industry.

The strategic plan is described here to serve as a guide to position the school to meet and exceed the vision and goals of the graduate program. It is expected that it will lead to national and international recognitions amongst peer programs, academia, research community and industry.

MISSION

The field of materials science and engineering is expanding into a period of unprecedented intellectual challenges, opportunities and growth. Products of materials science and engineering research contribute to the economic strength and security of our state and the country.

VISION

The vision for the MSE department is to create novel materials for the current and future technologies for energy, aerospace, medical, and electronic systems, and the mission is to educate and train excellent students for the academia and industries. Collectively, the goal for the MSE program is to be known as one of the highly ranked programs in the nation.



ACADEMIC GOAL: Be a renowned leader in education and mentoring of next generation of materials scientists and engineers who can develop innovative and creative technologies for the twenty-first century with applications in the aerospace, energy and biotechnology sectors.

STRATEGIES FOR ACADEMIC GOAL

- Develop required and elective courses for the graduate programs with specialization in advanced materials for energy, nanotechnology, and medical systems.
- Admit 10-15 new graduate students each year for M.S. and Ph.D. degrees.
- Hire 4 new tenure-track faculty members over the 5-year period in strategic areas of materials for energy, nanotechnology, advanced characterization, processing and biotechnology.

5-YEAR BENCHMARK FOR ACADEMIC GOAL

- Award 10 M.S. and 2 Ph.D. degrees of the highest caliber annually to talented engineering students.
- Attract at least 5 students annually from the undergraduate programs at Oklahoma State University and other undergraduate programs from across Oklahoma to enter the graduate program in Materials Science and Engineering.
- Provide a complete educational experience with 8 full-time faculty (combination of tenured and tenure-track faculty), 2-research staff/faculty and 3 post-doctoral fellows.
- Develop and offer a complete curriculum of courses for graduate education in Materials Science and Engineering including: 6 core courses, and 12 elective courses in advanced topics.
- Advance pedagogy in graduate engineering education in Materials Science and Engineering.
- Implement a bi-annual curriculum development plan.

RESEARCH GOAL: Develop a top-quality research program that encourages faculty to conduct cutting-edge research in materials science and engineering supported through intra-mural and extra-mural funds.

STRATEGIES FOR RESEARCH GOAL

- Conduct research at the forefront of Materials Science and Engineering.
- Recruit research active faculty with an average research expenditures >\$250/year.
- Support nominations of faculty and students for professional awards.
- Support faculty for active participation in professional societies.

5-YEAR BENCHMARK FOR RESEARCH GOAL

- Be recognized as one of the leading research and graduate programs in Material Science and Engineering graduate schools in South Eastern/Mid West US.
- Be recognized as one of the top 40 US graduate programs in Material Science and Engineering, as measured by US News and World Report, NSF and ASEE.
- Conduct more than \$1 million in research expenditures annually from tenured and tenure track faculty.
- Publish more than 15 research articles in leading archival journals each year.
- Research presentations at leading national and international conferences/workshops on topics in Materials Science and Engineering.

OUTREACH GOAL: To make a significant positive impact on the economic vitality of the Nation with an emphasis on the Tulsa and North Eastern Oklahoma area through research, technology creation, and commercialization.

STRATEGIES FOR OUTREACH GOAL

- Engage local industries with MSE faculty, graduate students, and research staff.
- Support faculty to write patent disclosures and patents.
- Encourage applied research projects leading to creation of novel technology and products.
- Provide training to faculty and research staff in product development and importance of intellectual property.

5-YEAR BENCHMARK FOR OUTREACH GOAL

- Submit at least 5 patent disclosures per year
- At least 2 issued patents
- Sign at least 1 license or option to license with our industrial partners
- Through technology transfer, create measurable economic impact and jobs for the industrial partners
- Involve local industries and develop projects of importance to them.

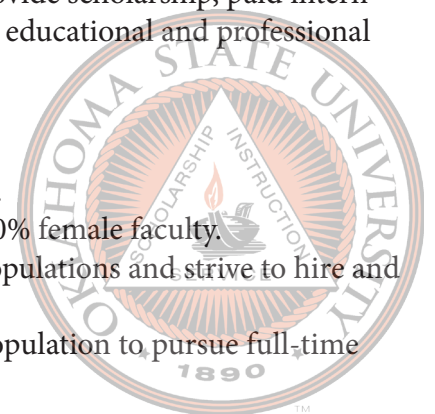
STUDENTS GOAL: Develop an atmosphere where students work together with faculty and industries, while encouraging diversity, academic success, leadership, professional development, and high ethical standards.

STRATEGIES FOR STUDENTS GOAL

- The School will work towards recruiting and retaining ethnically, racially, and gender diverse students and faculty that succeed in maintaining or raising our academic, research and ethical standards. Through school, college, NSF and private partnerships, the school will recruit graduate students nationally and internationally, and in particular from 4-year regional universities across Oklahoma, representing the diverse demographics of Oklahoma, and the undergraduate student population from OSU engineering undergraduate programs.
- The School will provide broad opportunities, course offerings and mentoring to encourage all students to graduate within 2-3 years with a M.S. or within 4-5 years with a Ph.D. The School will ensure that all students will pursue their graduate degrees and complete the degree according to the graduate committee approved course plan.
- The School is committed to working with alumni and industry to provide scholarship, paid internships and paid research opportunities to encourage students to pursue educational and professional training in materials science and engineering.

5-YEAR BENCHMARK FOR STUDENTS GOAL

- Graduate an average of 10 M.S. and 2 Ph.D. degrees per year in MSE.
- Reach 25% female student population and strive to hire and retain 20% female faculty.
- Reach 10% Hispanic/African American/American Indian student populations and strive to hire and retain 10% Hispanic/African American/American Indian faculty.
- Reach 25% Native Oklahoma students out of the graduate student population to pursue full-time graduate studies.
- Support at least 80% of the graduate students through GRA positions.



COLLEGE OF ENGINEERING, ARCHITECTURE & TECHNOLOGY

DIVISION OF TECHNOLOGY

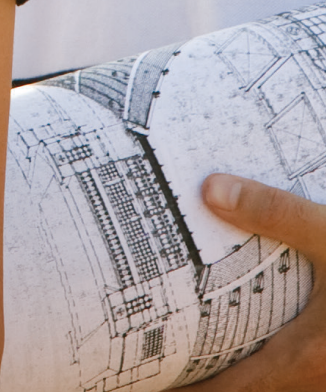
STRATEGIC PLAN 2014-2018



FLINTCO
Constructive Solutions
JASON WILSON

FLINTCO
Constructive Solutions
MATT CUNDITH

FLINTCO
Constructive Solutions
BRITNEY THOMPSON



STRATEGIC PLAN 2014-2018

THE DIVISION OF TECHNOLOGY AT OKLAHOMA STATE UNIVERSITY is the home of four separate and distinct engineering technology programs: Construction Management Technology, Electrical Engineering Technology, Fire Protection and Safety Engineering Technology, and Mechanical Engineering Technology. All programs are ABET accredited and each program has a separate curriculum, industry advisory board, academic program department, and Bachelor of Science in Engineering Technology degree. The emphasis of each program is a hands-on, applied engineering approach to education. Currently, all Engineering Technology students are undergraduate students. The Division of Engineering Technology produces 30% of the Bachelor Degrees awarded by the College of Engineering, Architecture, and Technology each year. Prior to the current academic year, most Engineering Technology faculty were hired as teachers and placed under heavy teaching loads that allowed little time for scholarly endeavors. Teaching loads need to be reduced in order to provide time for scholarly activities. Engineering Technology departments need to forge alliances with the Engineering Schools and the School of Architecture to promote scholarly activity. The separate departments of Engineering Technology need to scale the academic walls built between departments in past years and revise curricula to effectively instruct lower division students across departmental boundaries, thereby efficiently using faculty resources. Avenues need to be opened between Engineering Technology departments and the Engineering Schools to allow Engineering Technology Graduates to progress efficiently towards Masters degrees in the Schools of Engineering.

CORE VALUES

Excellence – We seek excellence in all our endeavors, and we are committed to continuous improvement.

Integrity – We are committed to the principles of truth and honesty, and we will be equitable, ethical, and professional.

Intellectual Freedom – We believe in ethical and scholarly questioning in an environment that respects the rights of all to freely pursue knowledge.

Service – We believe that serving others is a noble and worthy endeavor.

Diversity – We respect others and value diversity of opinions, freedom of expression, and other ethnic and cultural backgrounds.

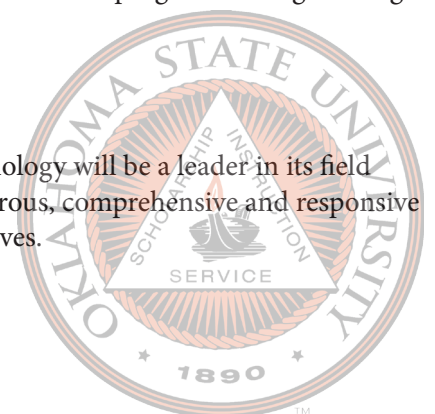
Stewardship of Resources – We are dedicated to the efficient and effective use of resources. We accept the responsibility of the public's trust and are accountable for our actions.

MISSION

The Division of Engineering Technology prepares future technologists to enrich lives and enhance society through professional level performance within the four programs in engineering technology.

VISION

Each distinct program in the Division of Engineering Technology will be a leader in its field and its graduates will be the choice of industry due to a rigorous, comprehensive and responsive curricula focused on enhancing our society and enriching lives.



ACADEMIC GOAL: Efficiently leverage faculty by developing and refining lower division engineering technology courses that meet the educational objectives of multiple engineering technology programs.

METRICS FOR ACADEMIC GOAL

- Appoint a curriculum coordination committee consisting of two faculty from each department.
 - Curriculum coordination committee gleans common course objectives from all Engineering Technology lower division courses without regard to home department.
 - Coordination committee develops new multi-department courses meeting common objectives.
 - Courses adopted in each department resulting in more efficient use of faculty.
-
- Success Milestone: One multi-department course offered per Engineering Technology Department.

PROGRAMS GOAL: Develop multi-disciplinary engineering technology program options such as electro-mechanical, mechatronics, energy construction, HVAC-Electrical Construction, Construction Safety, and Petroleum Operations.

METRICS FOR PROGRAMS GOAL

- Appoint a multi-disciplinary committee consisting of two faculty from each department.
 - Multi-disciplinary committee gleans common course objectives from all Engineering Technology upper division courses without regard to home department.
 - Multi-disciplinary committee develops new multi-department courses meeting common objectives of two or more courses.
 - Courses are adopted for use by two or more departments resulting in a joint option to the program(s).
 - Recruit one additional faculty member for each program option developed.
-
- Success Milestone: One multi-disciplinary option offered per Engineering Technology Department.



GRADUATE PROGRAMS GOAL: Develop an Engineering Technology Graduate program to produce a Masters of Engineering Technology.

METRICS FOR GRADUATE PROGRAMS GOAL

- Appoint Engineering Technology faculty to Engineering Technology Graduate Student committee consisting of two Engineering Technology faculty from each department.
- Engineering Technology Graduate Committee to develop program that opens avenues and forges alliances with the related schools of engineering to provide capable graduates students.
- Engineering Technology Graduate Committee to develop program that opens avenues and forges alliances with the related schools of engineering to provide Engineering Technology faculty capable of assisting research activities, mentoring graduate students, and developing funded research.
- Engineering Technology Graduate Committee to develop promotional program for Engineering Technology upper division students and Engineering Technology graduates to attend CEAT Graduate Schools.
- Resources Needed: One additional faculty for Graduate Coordinator.
- Success Milestone: Two Engineering Technology graduates per department entering Graduate School in CEAT.

FACULTY GOAL: Increase faculty lines to provide windows of opportunity for faculty to pursue creative/research opportunities to support Engineering Technology Graduate Program.

METRICS FOR FACULTY GOAL

- Study application of Engineering Technology workload model to determine overloaded (and under loaded) Engineering Technology faculty.
- Educate Engineering Faculty upon desired 75% teaching/25% research work load model.
- Determine additional faculty required to meet desired work load.
- Justify and Hire faculty.
- Resources needed: One additional faculty member per program.
- Success Milestone: Two new Engineering Technology faculty lines filled beyond 2015 hires.



INTERNATIONAL GOAL: Develop a Study Abroad Program to serve Engineering Technology students and faculty.

METRICS FOR INTERNATIONAL GOAL

- Form alliances with multi-national companies to explore internships abroad and need for OSU Engineering Technology students to work abroad.
- Develop funding sources to reduce cost to Engineering Technology student.
- Remove curriculum road-blocks to seamless internship with no additional time in school for internship.
- Resources needed: One additional staff member for Work-Abroad Coordinator.

- Success Milestone: 10% of graduates with a Study Abroad experience.

TEACHING GOAL: Develop courses and options in each program to meet newly discovered needs of industry such as Building Information Modeling, Heavy/Highway, Industrial Construction, and Petroleum Operations.

METRICS FOR TEACHING GOAL

- Appoint Engineering Technology faculty Horizon committee to explore industry needs for Engineering Technology graduates having new technology experiences.
- Develop courses (across disciplines if necessary) to meet the new technology needs.
- Implement courses when faculty expertise is obtained.
- Resources needed: Additional training for existing faculty, or new faculty with experience.

- Success Milestone: One new course/One new option in each department.



INDUSTRY GOAL: Develop programs to strengthen relationships with industry such as six-month co-op programs for students, summer internships for faculty, and providing solutions for real world projects from industry.

METRICS FOR INDUSTRY GOAL

- Develop a “meet-your-needs” group of Engineering Technology faculty to:
 - Form alliances with regional and national companies seeking Co-op students.
 - Form alliances with regional and national companies seeking faculty summer interns.
 - Form alliances with local, regional and national companies seeking solutions for real projects.
 - Provide a communication hub to match needs with students and faculty.
- Resources needed: One additional staff and two additional faculty for Fab-Lab.
- Success Milestone: Two new Co-op students and one faculty intern per department.
- Success Milestone: \$100,000 income for Fab-Lab.



COLLEGE OF ENGINEERING, ARCHITECTURE & TECHNOLOGY

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