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.
**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.
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.

**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.

**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.