TEXAS TECH UNIVERSITY
Edward E. Whitacre Jr.
College *of* Engineering™

Where Red Raiders Take Flight

Inside the Future of Mechanical and Aerospace Engineering at Texas Tech

SPRING 2026

Research Highlights

Indrajit Srivastava
Assistant Professor

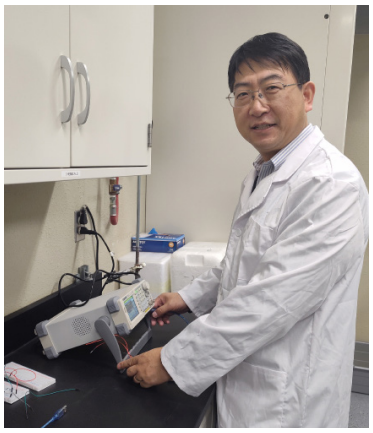
Dr. Srivastava Earns the Welch Research Grant and AHA Career Award

Dr. Indrajit Srivastava, assistant professor, has been awarded the prestigous Welch X Pilot Grant to advance research in afterglow luminescence through molecular self-assembly. His team aims to develop innovative "ping-pong" molecular systems capable of storing and releasing light with precision. This cutting-edge work could pave the way for breakthroughs in bioimaging and next-generation optical technologies. In addition, Dr. Srivastava also received the Career Development Award from the American Heart Association. This award is given to rising stars in the biomedical fields.

NIH Supports Texas Tech Innovation in Biomedical Engineering

Dr. James Yang and collaborators are developing the next-generation magnetic technology to separate red blood cells more efficiently. The NIH grant will help the team advance medical research while training future engineers in cutting-edge biotechnologies. In addition to the research itself, the project will provide invaluable hands-on experience for graduate and undergraduate students, preparing the next generation of engineers for careers at the intersection of biotechnology and healthcare innovation.

James Yang (right)
Professor



Jingfei Liu
Assistant Professor

Researchers Earn NSF Grant to Advance 3D Bioprinting

Dr. Jingfei Liu's team received a grant from the National Science Foundation to pioneer using acoustical engineering techniques to advance 3D bioprinting. This project will develop methods and devices to dynamically control live-cell patterns or distribution during the bioprinting process, which is critical for the biofabrication of complex tissue structures. This innovative approach could dramatically improve the structural fidelity and viability of printed tissues, potentially leading to breakthroughs in regenerative medicine and personalized therapeutics. Dr. Liu's lab also develops acoustics-related technologies for medical diagnosis and therapy. Examples of ongoing projects include developing ultrasound-based elastography methods to characterize the in vivo mechanical properties of tissues and using transcranial focused ultrasound to modulate neural network function in the brain.

Prestigious Grant from the Semiconductor Industry

Dr. Zeeshan Ahmad has been named one of 20 researchers worldwide to receive the Samsung Global Research Outreach (GRO) grant. This grant will enable him to leverage machine learning methods for large-scale simulations and determine the precise mechanism of how organic molecules inhibit copper corrosion. The project addresses a critical stage in semiconductor manufacturing, known as chemical mechanical planarization (CMP), an essential process in fabricating advanced microchips. The project also will create hands-on research opportunities for students in cutting-edge computational materials science, preparing the next generation of engineers and data scientists.

Zeeshan Ahmad
Assistant Professor

Awards & Recognitions

Dr. Michelle Pantoya Named Paul Whitfield Horn Distinguished Professor

Dr. Michelle Pantoya has been appointed the Paul Whitfield Horn Distinguished Professor, the highest honor Texas Tech University bestows upon a tenured faculty member. This prestigious recognition celebrates her exceptional contributions to both cutting-edge research and outstanding teaching throughout her career at TTU. The Horn Professorship reflects the university's deepest admiration for faculty who elevate Texas Tech's academic reputation on an international scale.

Michelle Pantoya
Horn Distinguished Professor

Jeff Hanson
Senior Lecturer

Dr. Jeff Hanson Named University Distinguished Educator

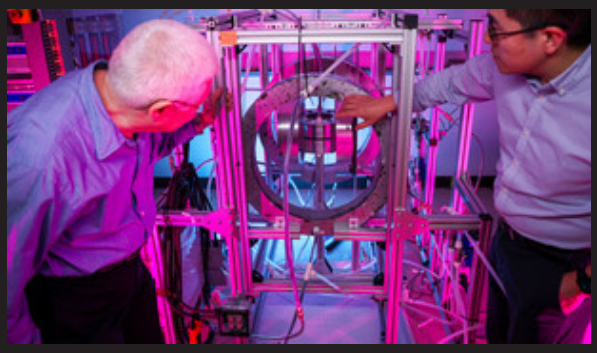
Please join us in congratulating Dr. Jeff Hanson for being selected as one of two recipients of Texas Tech's inaugural University Distinguished Educator award. This award recognizes his significant and ongoing accomplishments in teaching. As the highest honor bestowed upon teaching faculty at Texas Tech University, this award recognizes exceptional dedication to student success. Dr. Hanson has motivated and inspired countless students on both professional and personal levels.

Faculty Earn Recognition for Innovation, Teaching, and Research

Dr. Beibei (Helen) Ren was honored at the 8th Annual Inventor Celebration for receiving two United States patents focused on improving renewable energy systems and sustainable home utilities. Meanwhile, Dr. Paul Egan was named the 2025 Emerging Inventor of the Year for his work on developing medical technologies through advanced 3D printing and entrepreneurial ventures. Together, their achievements highlight the department's commitment to research that advances technology and improves quality of life. Dr. Ren also received the IEEE Standards Working Group Award and the TTU Chacellor Council Distinguished Teaching Award.

Paul Egan (right)
Assistant Professor

Beibei (Helen) Ren
Professor



Jerzy Blawzdziewicz
Professor

Xiaolong Liu
Assistant Professor

Our Team of Researchers Receives NSF Grants on Artificial Cilia Technology

Faculty members receive a grant from the National Science Foundation to develop self-regulating artificial cilia arrays for precise fluid and particle manipulation. The project is led by Xiaolong Liu and Jerzy Blawzdziewicz, with a collaborator from Villanova University. The research aims to create microscale soft robotic filaments that can adapt their movement in real time, enabling applications in medical diagnostics, drug delivery, and micro scale manufacturing. By combining innovations in soft-composite manufacturing, embedded sensing, and model-based control, the research seeks to emulate the adaptability of biological cilia while improving durability and scalability.

New Programs

Aerospace Engineering

Texas is the undisputed epicenter of the America's new space industry. With SpaceX transforming Boca Chica into Starbase, Blue Origin launching spacecrafts in the West Texas, NASA's Johnson Space Center driving the continuous space exploration, and all of the defense companies having tech centers statewide, the demand for aerospace engineers has never been greater. Yet Texas Tech, one of the state's premier engineering institutions, has not had a formal aerospace engineering program. That changes now. By establishing an emerging aerospace engineering degree program, we are answering an urgent call from the industry, from our students, and from the future.

The photo shows the rocket designed and fabricated by the Raider Aerospace Society students that flew to 10,700 ft duirng a competition in 2025.

ME Technology

Mechanical Engineering Technology is the backbone of modern industry. We have restarted the ME Tech program to equip students with the knowledge and technical skills to design, manage, and execute manufacturing projects effectively. Combining practical hands-on experience with fundamental knowledge, the program emphasizes graphics, designs, materials, manufacturing techniques, and quality control. The courses will incorporate cutting-edge manufacturing equipment, materials testing technology, and design software to prepare graduates to meet the demands of a rapidly evolving industry. The program is designed to provide pathways to professional certification and continued education.

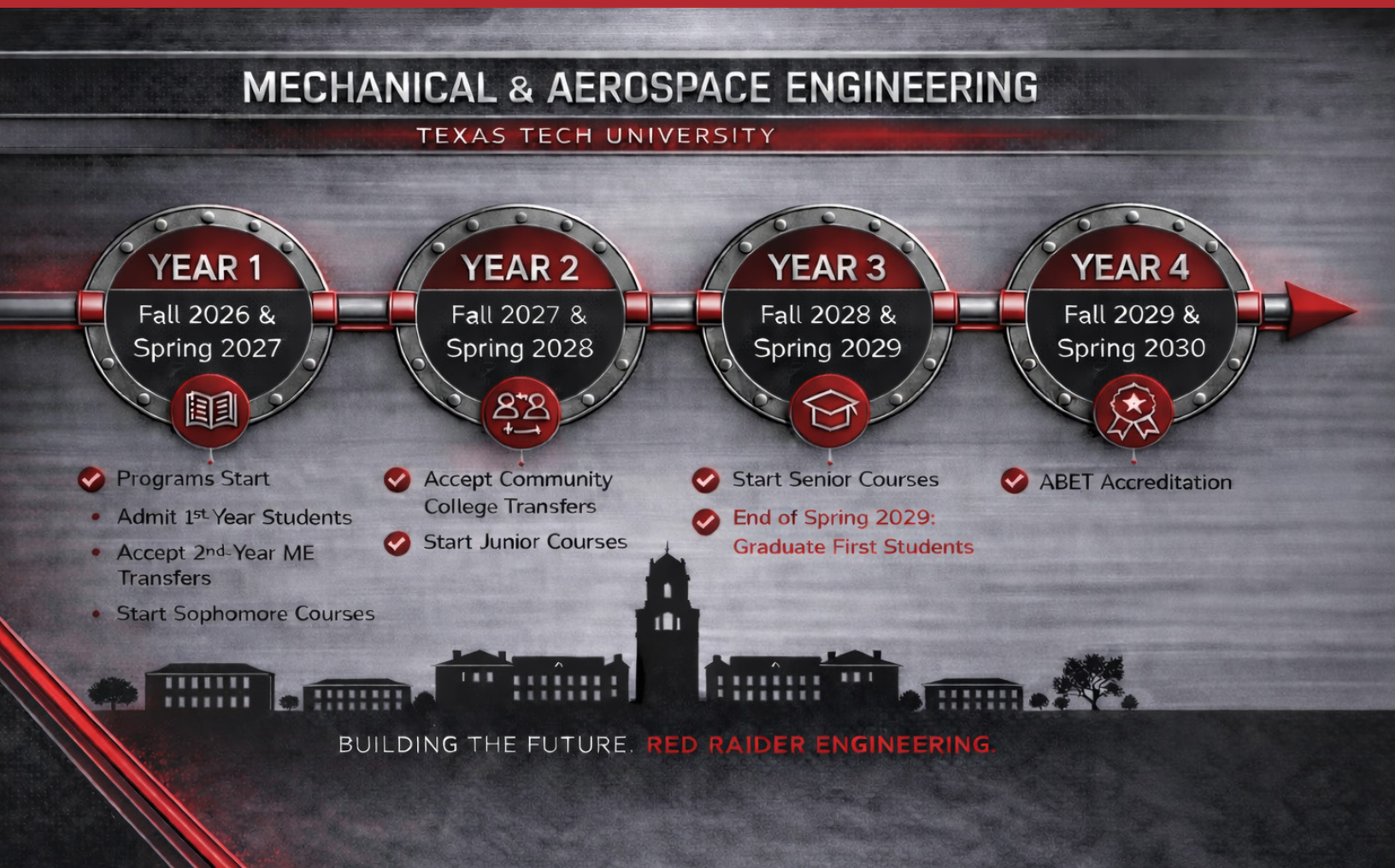


Photo taken in the Rentz Family Materials Testing and Metallurgy Laboratory

A Message from **Department Chair Dr. Kong**

As a land-grant university, our mission is to educate students across Texas and prepare the next generation of engineers to drive innovation and economic growth. Today, that mission is more exciting than ever. With rockets and spacecrafts launched by Space X and Blue Origin in South Texas capturing the imagination of students across the state, interest in aerospace engineering continues to rise—and we are proud to respond.

We have launched a new Bachelor of Science degree program in Aerospace Engineering and, with it, a new name: the Department of Mechanical and Aerospace Engineering (MAE). This change reflects both our growth and our commitment to inspiring students who are eager to explore engineering from the ground to space and beyond.

Our graduates are known for their hands-on skills, adaptability, and ability to tackle complex challenges. As industries increasingly demand engineers who can build quickly and test often, we have also re-established our Mechanical Engineering Technology BS program to prepare versatile, practice-oriented professionals. With three degree programs—Mechanical Engineering, Aerospace Engineering, and Mechanical Engineering Technology—the MAE Department is entering a period of significant growth. We anticipate our undergraduate enrollment will increase from 1,700 to approximately 2,400 students in the coming years. Even as we expand, our commitment to high-quality education remains unchanged. Our vision is to become one of the world's leading engineering programs, empowering students to advance engineering science and technology and to lead in their fields. To support this goal, we are enhancing our instructional laboratories, including plans for a second machine shop and a large wind tunnel capable of reaching 200 mph. We are also preparing to renovate the J.T. Powers Lecture Hall into a modern learning space that continues Dr. Powers' legacy.

In this inaugural MAE newsletter, you will find highlights of faculty research and student achievements. If you visit Lubbock, I invite you to see firsthand the energy and momentum of our new department. We are also expanding our faculty in key areas and welcome your recommendations and continued support as we advance our mission. Please do not hesitate to contact me at sokong@ttu.edu.

Song-Charng Kong
Department Chair, Don Kay Clay Cash Endowed Chair and Professor

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Student Organization Highlights & Robotics Spotlight

The Raider Aerospace Society is taking on the 2025-2026 AIAA Design/Build/Fly Competition. The team is designing a custom aircraft capable of carrying cargo (hockey pucks), representing passengers (ducks), and deploying a flying flag. They will tackle three exciting missions: a standard flight, a cargo-and-flag flight, and a speed challenge, testing their engineering skills, teamwork, and creativity to the fullest. The team photo was taken in June 2025 at the International Rocket Engineering Competition in Midland, TX.

From autonomous drones surveying West Texas oil fields to surgical robots transforming healthcare, the robotics revolution is reshaping every industry. Texas Tech is uniquely positioned to lead this transformation, combining strong mechanical engineering foundations with emerging capabilities in AI and sensor technology. The Department currently offers a robotics minor. The photo shows two autonomous vechiles and cameras for research in Dr. Tanushree Roy's Smart Human-centric Automation Resilience (SHARE) lab.

Explore. Innovate. Lead. Mechanical and Aerospace Engineering at Texas Tech