



**Strategic Goals
2010-2015
Department of Mechanical Engineering
University of Texas at El Paso**

About the Mechanical Engineering Department

The Department of Mechanical Engineering at UTEP has an enrollment of more than 562 graduate and undergraduate students. The department boasts a rapidly growing research program with emphasis in aerospace, energy and biomedical sciences. The department has research laboratories in biomedical manufacturing and engineering, combustion and propulsion, and high temperature materials. The department also has exceptional computational and CAD/CAM facilities. The department offers BS and MS degrees in Mechanical Engineering and a PhD track in Energy Science and Engineering. The department also participates in interdisciplinary PhD programs in Materials Science Engineering, Environmental Science and Engineering, and Computational Science. The department had over \$8.0 million in funded research last year, including a recent NASA University Research Center for Space Exploration Technology Research.



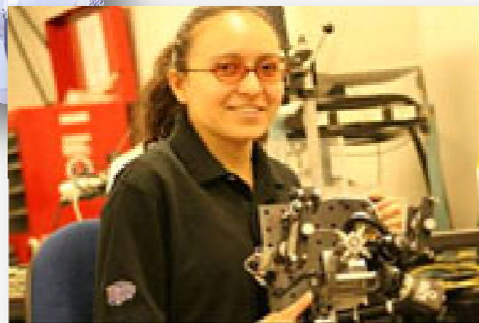
Vision Statement

The Mechanical Engineering Program strives to graduate mechanical engineers of the highest quality and to conduct state-of-the-art research.

Mission Statement

The Mechanical Engineering Program makes available a high quality, relevant engineering education to all residents of the El Paso region and beyond. The Program dedicates itself to providing students with a set of skills, knowledge and attitudes that will permit its graduates to succeed and thrive as engineers and leaders. The Program strives to:

- Prepare its graduates to pursue life-long learning, serve the profession and meet intellectual, ethical and career challenges.
- Maintain a vital, state-of-the-art research enterprise to provide its students and faculty with opportunities to create, interpret, apply and disseminate knowledge.



Strategic Goals

GOAL 1[a]: *We will enhance the quality of our graduates.*

- FE participation and passing rates
 - Owner – Louis Everett and Jack Dowdy
 - **90% passing rate**
- Enhanced Design Skills
 - Design Centric Curriculum
 - Owner – All Faculty
 - **Fully implemented the new design centric curriculum**
 - Instructional Laboratory Facilitates: Lockheed Martin Mechanical Engineering Laboratory and Engineering Design and Practice Clinic
 - Owner: Ahsan Choudhuri, Noe Vargas and all faculty
 - **Fully operational instructional laboratory facilities by year 3**
- Innovation and Entrepreneurship
 - Owner: Louis Everett, Garry Hawkins and All Faculty
 - **New course contents and curriculum realignment to train students in innovation and technology entrepreneurship.**

GOAL 1[b]: *We will enhance the quality of our faculty*

- Scholarship
 - Owner-All Faculty
 - **3 Journal Articles/year; 3 Conference Articles/year**
- Research Productivity
 - Owner-All Faculty
 - **250k/year extramural funding**
 - **1PhD and 2 MS graduates/year**
- Teaching Effectiveness
 - Owner-All Faculty
 - **90% of the faculty have student evaluations 4.0 or higher**
 - **90% of the faculty use and implement new engineering education tools.**
- National Prominence
 - Owner-All Faculty
 - **30% of the faculty receive a Fellow or an Associate Fellow designation from AIAA or ASME.**
 - **90% of the faculty are actively engaged in organizing technical tracks and sessions and chairing sessions in national and international conferences.**



- 3% of the faculty receive national and international awards.

GOAL 2: We will help students their educational and professional goals through experiences beyond the classroom.

- Participation in pre-professional experiences
 - Owner – Ahsan Choudhuri and Louis Everett
 - By year 5 - 80% participation in internship/co-op before graduation
 - Owner – Ahsan Choudhuri and Jack Chessa
 - By year 5 – RA/TA = 3/1 and PhD TA/MS TA = 5/1
- Effective advising
 - Owners – Ahsan Choudhuri, Louis Everett and Jack Chessa
 - By year 5 -20% reduction in the graduation time

GOAL 3: We will improve the quality of the workplace for all stakeholders by recognizing and developing competencies.

- Diversity of faculty
 - Owner – Schoephoerster
 - By year 4 – 33% Hispanic faculty, 20% female faculty
- Training and Re-training of Technical Staff Members
 - Owner-Ahsan Choudhuri
 - By year 4-All technical staff members will go through trainings and professional development courses for acquiring competencies in 21st century technologies.

GOAL 4: We will identify and build upon our competitive niches.

- **Strategic Thematic Focus**
 - Aerospace and Defense Engineering
 - Owner-Ahsan Choudhuri, Jack Chessa, C. V. Ramana, Roy Xu, and Arturo Bronson
 - By year 5- 2 million/year
 - Energy Engineering
 - Owner-Ahsan Choudhuri, C. V. Ramana, Vinod Kumar, Evgeny Shafirovich, Shaolin Mao and Norman Love
 - By year 5- 2 million/year
 - Advanced Manufacturing
 - Owner-Ryan Wicker, Noe Vargas, and Lin
 - By year 5- 0.5 million/year
 - Biomedical engineering



- Tau Xu and Roger Golzalez
- By year 5- 0.5 million/year
- **Strategic and Sustainable Research Capacity Building**
 - Strategic Partnerships
 - Owner- Ahsan Choudhuri
 - By year 3- MOUs and Partnership Agreements with WSTF, DOE-NETL, NASA GRC Spaceport America, Blue Origin, and Kyushu Tech.
 - Research Infrastructure
 - Owner- Ahsan Choudhuri and All Faculty
 - By year 5- 10,000 sqft new research laboratory facilities
 - By year 5- \$5 million dollar equipment and instrumentation
 - By year 5- \$2.5 million dollar research endowment
 - Faculty Development Programs
 - Owner-Ahsan Choudhuri
 - By year 4- 100% tenure track faculty attend summer faculty programs in national laboratories and research facilities.
- **Academic Program Development**
 - Owner-Ahsan Choudhuri, Louis Everett, and Jack Chessa
 - By year 5- Phd program in Mechanical Engineering; MS in Aerospace Engineering

GOAL 5: We will attract talent, funding, advocacy and resources to maximize opportunities for all COE stakeholders.

- Recruit and retain high quality faculty
 - Owner – Ahsan Choudhuri
 - By Year 5- 5 new faculty positions; 100% receive tenure/maintain productivity
- Recruit and retain high quality Research Staff Members
 - By year 5- 10 Research Assistant Professors and Research Engineers
- Recruit and graduate high quality doctoral students
 - Owners – Jack Chessa
 - By year 5 - 50 PhD students, 10 graduates per year
- Annual increases in external funding
 - Owners – Ahsan Choudhuri and All Faculty
 - By year 5 - \$5 million in research expenditures per year

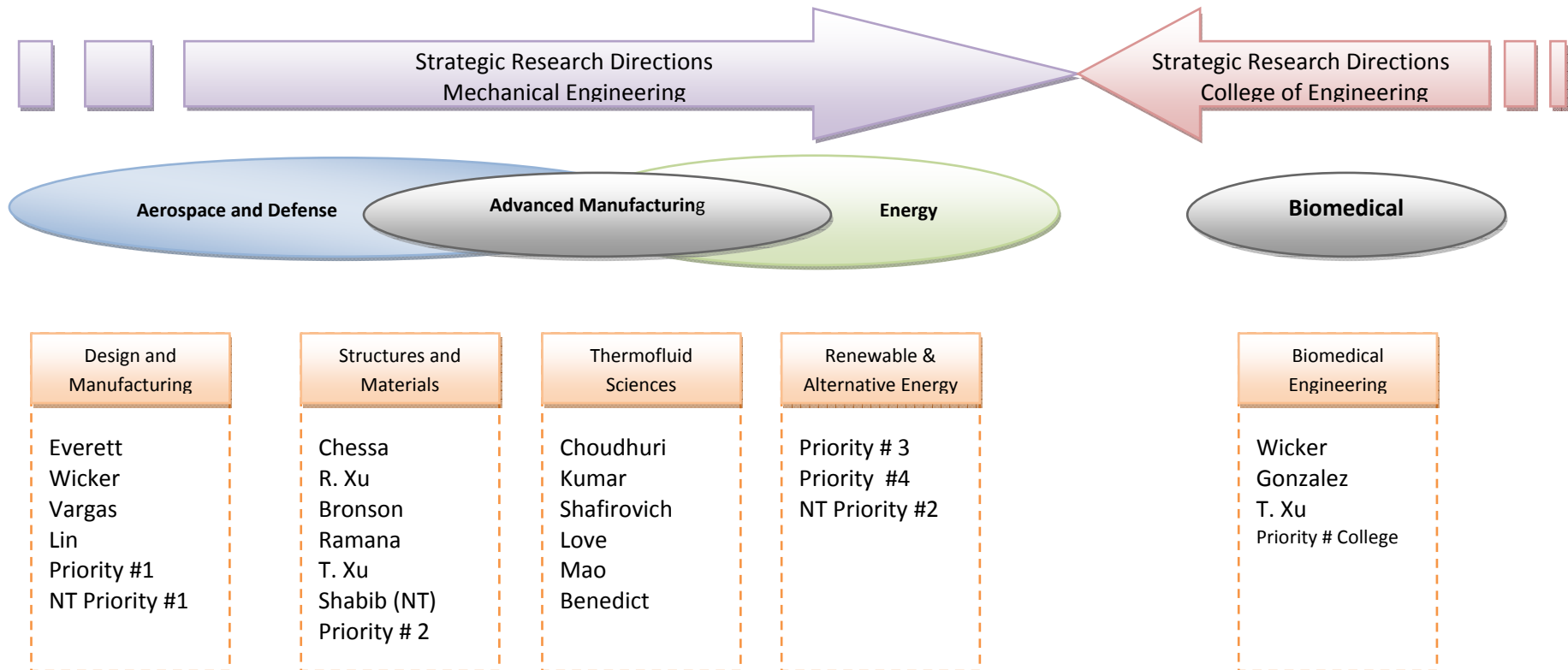


University, College, Department Strategic Plan Key Measures Alignment

	University		College		Department	
	2010	2015-2020	2010	2015-2020	2010	2015-2020
<i>Performance</i>						
Research Expenditures	\$60M	\$100M	\$12M	\$25M	\$2.5M	\$5M
Doctoral Degrees Awarded	60	200	10	40	-	10
<i>Growth</i>						
Number of Faculty	508	720	75	100	15	20
Number of Doctoral Programs	16	40	6	10	0	1
Total Enrollment	21,000	29,500	2800	3900	567	750
<i>Quality Assurance</i>						
Student/Faculty Ratio					37.8	37.5
Doctoral Students per Faculty	1	2	1	2	1.2	2.5
<i>Efficiency</i>						
Research Expenditures per Faculty	\$116K	\$168K	\$160K	\$250K	\$165K	\$250K
Doctoral Degree Completion Efficiency	0.29	0.39	0.29	0.39	-	0.75



Strategic Research Niches and Hiring Priorities



*NT: Non-Tenure Track

Specific Research Interests	
Advanced Propulsion High Temperature Materials 3D Manufacturing Composites Materials and Structures Design Engineering: Aerospace/Mechanical Systems	Low Carbon Energy Engineering Turbine Technologies Sensors and Energy Harvesting Materials CO ₂ Capture and Sequestrations High Capacity Factor Renewables Concentrating Solar Power Sustainable Design Engineering Industrial Energy Efficiency Building Energy Efficiency

Specific Research Interests
Tissue Regeneration Bio-mimetic materials Biomedical Manufacturing

Education Strategic Coordination Framework

