Ph.D. in Mechanical Engineering

The doctoral program in Mechanical Engineering with emphases in energy, aerospace, and advanced manufacturing.
The program will provide a broad-based, integrative education for doctoral students, including design thinking for complex engineered systems, research training in a creative knowledge environment, and research training in a national laboratory or industry setting.

The program's long-term vision is to create a new generation of doctoral graduates to lead industry innovation, to create new technology businesses, and to bring jobs to the economically disadvantaged southwest border region as well as to our state and nation. The program will complement Texas's conventional Mechanical Engineering doctoral programs, which focus on developing future educators. Instead, UTEP's program will focus on training future technology leaders for industry, which will strengthen the innovation ecosystem for regional, state, and national economic growth. Students in the program, trained in technology entrepreneurship and leadership, will partner with industry to create new jobs.

Each student must complete at least 84 semester credit hours beyond the bachelor's degree, of which at least 54 hours is coursework. Overall, the coursework requirements are flexible, so that the program may meet the changing needs of its stakeholders and students. In addition to conventional graduate classes in mechanical engineering, the program provides students with diverse perspectives by offering novel classes with content in technology entrepreneurship, leadership, and applied research project management.

Through integration into the program's doctoral curriculum, the UTEP energy, aerospace, and advanced manufacturing research programs will train the next generation of Mechanical Engineers with unique design skills and capabilities. Graduates' expertise in advanced technologies aligned with national interests will help the U.S. meet the demand for highly skilled Mechanical Engineering professionals and ensure a Mechanical Engineering workforce representative of the nation's 21st-century demographics.

The design of the doctoral program in Mechanical Engineering reflects the department's vision, mission, and educational objectives, particularly in emphasizing both technical excellence in the discipline and broader skills that promote student success in industry.

Admissions Requirements

- An official transcript, with the four-year baccalaureate degree posted, from the degree-granting institution and copies of transcripts for all other relevant upper-division and graduate work at accredited U.S. institutions or equivalent work and degrees at foreign institutions.
- Bachelors or Master’s degree in Mechanical Engineering or a related field in Engineering or Science.
- Statement of Purpose.
- 3 Letters of recommendation.

Applicants whose degrees are from non-English speaking institutions are required to demonstrate English proficiency. Please consult the Graduate School (https://www.utep.edu/graduate/future-students/applicant-timelines.html) website for required scores.

Educational Objectives

- Our graduates excel as engineers with solid technical skills, strength in design, and an ability to work with complex engineering systems.
- Our graduates recognize the importance of and participate in continuous learning activities to advance their careers, personal interests and life goals.
- Our graduates become industrial and civic leaders and demonstrate entrepreneurial spirit.

Degree Plan

For entering students with a bachelor's degree or equivalent

Required Credits: 84

Code	Title	Hours
Required Courses		
MECH 6396	Doctoral Research	24
MECH 6301	Mathl Methods for Mech Eng	3
Prescribed Elective Courses		
Select 33 hours from the list below		**33**
MECH 6302	Solid Mechanics I	3
MECH 6303	Heat Transfer I	3
MECH 6305	Comp. Fluid Dynamics	3
MECH 6306	Princ of Experiment & Eng Dev	3
MECH 6307	Eng Regulation and Policy	3
MECH 6308	Prod Dev in Entrepren Ventures	3

MECH 6310	Thermodynamics	3
MECH 6311	Adv Finite Element Analysis	3
MECH 6312	Solid Mechanics II	3
MECH 6313	Mech of Composite Materials	3
MECH 6318	Analytical Dynamics	3
MECH 6334	Space Systems Design	3
MECH 6335	Aerospace Propulsion	3
MECH 6336	Aerospace Structures	3
MECH 6337	Aero Dynamics and Controls	3
MECH 6390	Spec Topics in Mechanical Eng	3
MECH 6396	Doctoral Research	3
MECH 6391	Individual Studies	3
MECH 6397	Graduate Projects	3
Free Elective Course		
Select 18 hours from the list below		**18**
ESE 6301	Environmental Law and Policy	3
ESE 6307	Interdisciplin Envir Prob Solv	3
ESE 6320	Adv Topics in Energy Engr	3
MECH 6323	Micromechanics	3
MECH 6343	Advanced Manufacturing(3DPrin)	3
MECH 6363	Turbomachinery	3
MECH 6364	Turbulence I	3
CE 6304	Adv Design of Struct Systms	3
CE 6305	Advanced Structural Analysis	3
CE 6307	Finite Element Method	3
CE 6320	Advanced Geotechnical Eng.	3
CE 6325	Design for Dynamic Loads	3
CE 6409	Environmental Eng Chemistry	4
IE 5351	Linear and Combin Optimiz Meth	3
IE 5352	Design/Analysis Indust Exprmnt	3
IE 5357	Computer Simulation Appli	3
IE 5385	Advanced Quality Control	3
IE 5390	Special Topics Industrial Engr	3
MECH 6328	Fracture Mechanics	3
MFG 5390	Special Topics	3
MFG 5311	Design for Manufacturability	3
MFG 5312	Strategic Design-Mfg Processes	3
MFG 5321	Modeling/Analysis-Mfg Process	3
MFG 5350	Reliability & Maintainability	3
MFG 5359	Computer-Aided Manufacturing	3
MME 6304	Phase Transformations & Micros	3
MME 6308	Mechanical Behavior of Matls	3
MME 6401	Microstruc & Microchem Charac	4
MME 6403	Adv Concepts in Matls Sci Engr	4
Required Dissertation Courses		
MECH 6399	Dissertation II	3
MECH 6398	Dissertation I	3
Total Hours		**84**

For entering students with a master's degree or equivalent

Required Credits: 60

Code	Title	Hours
Required Courses		
MECH 6396	Doctoral Research	24
MECH 6301	Mathl Methods for Mech Eng	3
Prescribed Elective Courses		
Select 15 hours from the list below		**15**
MECH 6306	Princ of Experiment & Eng Dev	3
MECH 6307	Eng Regulation and Policy	3
MECH 6308	Prod Dev in Entrepren Ventures	3
MECH 6302	Solid Mechanics I	3
MECH 6303	Heat Transfer I	3
MECH 6305	Comp. Fluid Dynamics	3
MECH 6306	Princ of Experiment & Eng Dev	3
MECH 6310	Thermodynamics	3
MECH 6311	Adv Finite Element Analysis	3
MECH 6312	Solid Mechanics II	3
MECH 6313	Mech of Composite Materials	3
MECH 6318	Analytical Dynamics	3
MECH 6334	Space Systems Design	3
MECH 6335	Aerospace Propulsion	3
MECH 6336	Aerospace Structures	3
MECH 6337	Aero Dynamics and Controls	3
MECH 6390	Spec Topics in Mechanical Eng	3
MECH 6391	Individual Studies	3
MECH 6396	Doctoral Research	3
MECH 6397	Graduate Projects	3
Free Elective Course		
Select 12 hours from the list below		**12**
ESE 6301	Environmental Law and Policy	3
ESE 6307	Interdisciplin Envir Prob Solv	3
ESE 6320	Adv Topics in Energy Engr	3
MECH 6323	Micromechanics	3
MECH 6343	Advanced Manufacturing(3DPrin)	3
MECH 6363	Turbomachinery	3
MECH 6364	Turbulence I	3
CE 6304	Adv Design of Struct Systms	3
CE 6305	Advanced Structural Analysis	3
CE 6307	Finite Element Method	3
CE 6320	Advanced Geotechnical Eng.	3
CE 6325	Design for Dynamic Loads	3
CE 6409	Environmental Eng Chemistry	4
IE 5351	Linear and Combin Optimiz Meth	3
IE 5352	Design/Analysis Indust Exprmnt	3
IE 5357	Computer Simulation Appli	3
IE 5385	Advanced Quality Control	3
IE 5390	Special Topics Industrial Engr	3
MECH 6328	Fracture Mechanics	3
MFG 5390	Special Topics	3
MFG 5311	Design for Manufacturability	3
MFG 5312	Strategic Design-Mfg Processes	3
MFG 5321	Modeling/Analysis-Mfg Process	3
MFG 5350	Reliability & Maintainability	3

MFG 5359	Computer-Aided Manufacturing	3
MME 6304	Phase Transformations & Micros	3
MME 6308	Mechanical Behavior of Matls	3
MME 6401	Microstruc & Microchem Charac	4
MME 6403	Adv Concepts in Matls Sci Engr	4
Required Dissertation Courses		
MECH 6399	Dissertation II	3
MECH 6398	Dissertation I	3
Total Hours		**60**