

# Ph.D. in Materials Science and Engineering (MASE) (Interdisciplinary)

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The field of materials sciences and engineering is central to the technological, industrial, and economic development of Texas, the United States, Mexico, and other industrialized countries. The UTEP PhD program MASE is a multi-disciplinary program to prepare scientists and engineers to contribute to this vital field, with a range of skills linking structure, properties, synthesis and processing, and performance of materials. Students develop a research focus in a specialized area using one or more of these skills to study some class or classes of materials, including metals, polymers, ceramics, semiconductors, superconductors, composites, and other materials systems.

## Admission Requirements

Admission to the PhD program in materials science and engineering with a BS or MS degree in a related field (Physics, Chemistry, Electrical and/or Electronic Engineering, etc.) from an ABET accredited institution in the United States, or proof of equivalent education from an international institution, requires a minimum 3.0 GPA. Program requires minimum English Language proficiency. The current requirements can be found under Admissions in the Graduate School website. Specific admission requirements for the Ph.D. Program in Materials Science and Engineering are described below.

1. Undergraduate or graduate degree in Materials Science and Engineering or a related field from an ABET accredited institution in the United States, or proof of equivalent education from an international institution.
2. Demonstration of academic achievement and potential as indicated by the results of the Graduate Record Examination (GRE), and upper-level undergraduate and graduate coursework. The GRE requirement is waived for students from UTEP.
3. Three letters of recommendation.
4. A written statement of intent, describing applicant's career goals and describing their vision of the path to those goals (including a summary of previous preparation and applicant's expectations from the graduate program).
5. Submission of a CV/resume summarizing professional and academic experience and any other evidence of background, knowledge, research, or work experience in Materials Science and Engineering that may be relevant.
6. Applicants from countries where English is not the first language are required to demonstrate English proficiency. Please consult the graduate school (<http://catalog.utep.edu/admissions/graduate/graduate-student/>) website for required scores.

### Background required for Ph.D. in MASE Degree

Students should have a background in the following courses or equivalent: MME 3308 Appl Chemical Thermodynamics, MME 3406 Nanofunctnl Physical Metallurgy, MME 3306 Rate Processes, and MME 3407 Mechanical Behavior of Matls. If the student does not have the required background, the students are required to complete these courses.

The UTEP MASE program currently does not offer a terminal master's degree.

Students are required to pass an oral Qualifying Examination (Dissertation Proposal Defense) administered by their Research Committee. This qualifying examination consists of defending a written dissertation proposal and answering questions of either a broad or specific nature in relationship to their dissertation research project. This examination is usually administered after a minimum of two semesters of work. Students cannot register for dissertation credits until after the Qualifier Examination has been successfully passed. Students can enroll in appropriate graduate research projects or independent study courses prior to passing the examination.

Students are required to submit at least one paper as first author along with the research advisor (if applicable to include research advisor) to a peer-reviewed journal. The paper must be submitted before the student can schedule their dissertation proposal. At the conclusion of the research program, the student will make a public presentation of the dissertation and submit a dissertation document. The format requirements of the dissertation document can be found on the graduate school website. This will also constitute a Final Oral Examination or Dissertation Defense with questions from both the Dissertation Committee and the general public.

## Degree Requirements

A minimum of 74 credit hours are required to satisfy the MASE Ph.D. Program requirements. All students who enter the MASE Ph.D Program are required to take 17 credit hours of core courses. Students who enter with an MS degree in Materials Science and Engineering or a related field (Physics, Chemistry, Electrical and/or Electronic Engineering, etc.) can receive up to 30 credit hours towards the MASE Ph.D. Degree requirements. The remaining course credits can be made up with MASE electives or graduate research/independent study courses for a total of 21 credits. Students entering with a BS degree will be required to complete 21 credit hours of elective courses and 30 credit

**Remedial Courses: Do not count towards the degree requirements**

Code	Title	Hours
<b>Fall Semester</b>		
MME 3308	Appl Chemical Thermodynamics	3
MME 3406	Nanofuctnl Physical Metallurgy	4
<b>Spring Semester</b>		
MME 3306	Rate Processes	3
MME 3407	Mechanical Behavior of Matls	4

hours of MASE elective or graduate research/independent study courses. The student is allowed to enroll in up to six (6) credit hours of approved coursework in areas outside the Materials Science and Engineering (MASE) Program, pending approval from the Graduate Advisor. The core and elective courses (discussed below) are traditional lecture or seminar courses. The student will take a minimum of six (6) credit hours of Doctoral Dissertation. All courses require a grade of C or better and a minimum GPA of 3.0 is required for graduation.

## Degree Plan

Two options are available for students: Entering with a M.S. degree or entering with a B.S. degree.

### Entering with an MS Degree

Code	Title	Hours
<b>Requirements</b>		
Credit from MS (up to 30 hours)		30
Core		17
Research and/or Electives		21
Dissertation		6

### Entering with a B.S. Degree

Code	Title	Hours
<b>Requirements</b>		
Core		17
Electives		21
Research and/or Electives		30
Dissertation		6

### **Ph.D. in Materials & Science Engineering**

Required Credits: 74

Code	Title	Hours
<b>PhD in Materials Science &amp; Engineering (All courses require a grade of C or better)</b>		
<b>Core Courses:</b>		<b>17</b>
<b>Symposium:</b>		
Select three semesters from the following:		
MASE 6195	Doct. Rsrch Symposium I	
MASE 6196	Doct. Rsrch Symposium II	
Select one of the following:		
MASE 6245	Electron Microscopy Appl	
MASE 6290	Contem Topics-Materials Sci/E	
<b>Required Courses:</b>		
MASE 6400	Advanced Concepts Mat Sci/Engr	
MASE 6401	Applied Matls Sci & Eng	
MASE 6402	Microchem/Microstruc Char Matl	
<b>Dissertation Work:</b>		
Select fifty-one hours from the following:		<b>51</b>
MASE 6190	Contem Topics-Materials Sci/E	

MASE 6191	Individual Studies	
MASE 6194	Graduate Research Projects	
MASE 6195	Doct. Rsrch Symposium I	
MASE 6196	Doct. Rsrch Symposium II	
MASE 6245	Electron Microscopy Appl	
MASE 6290	Contem Topics-Materials Sci/E	
MASE 6291	Individual Studies	
MASE 6294	Graduate Research Projects	
MASE 6305	Adv Processing of Materials	
MASE 6311	Ceramics	
MASE 6312	Polymer Engineering	
MASE 6315	Metallography and Micro Inter.	
MASE 6321		
MASE 6340	Advanced Failure Analysis	
MASE 6342	Hydrometallurgy	
MASE 6343	Advanced Materials/Composites	
MASE 6344	Interfacial Phenomena	
MASE 6350	Material Joining Technologies	
MASE 6351	Non-Destructive Examination	
MASE 6352	Root Cause Analysis	
MASE 6353	Fracture Mechanics	
MASE 6390	Contem Topics-Materials Sci/En	
MASE 6391	Individual Studies	
MASE 6394	Graduate Research Projects	

**Dissertation:**

MASE 6398 & MASE 6399	Dissertation and Dissertation	6
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<b>Total Hours</b>		<b>74</b>
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Code	Title	Hours
<b>Entering with MS Degree</b>		
<b>Requirements</b>		
Core		
		17
Research or Electives		
		21
Credit from MS (up to 30 hours)		
		30
Dissertation		
		6
<b>Entering with BS Degree</b>		
Core		
		17
Research or Electives		
		30
Electives		
		21
Dissertation		
		6
<b>Required Core: 17 hours</b>		
<b>Fall Semester</b>		
MASE 6401	Applied Matls Sci & Eng	4
MASE 6402	Microchem/Microstruc Char Matl	4
MASE 6103		
MASE 6195	Doct. Rsrch Symposium I	1
MASE 6196	Doct. Rsrch Symposium II	1
MASE 6196	Doct. Rsrch Symposium II	1
<b>Spring Semester</b>		
MASE 6400	Advanced Concepts Mat Sci/Engr	4
MASE 6103		
MASE 6195	Doct. Rsrch Symposium I	1

MASE 6196	Doct. Rsrch Symposium II	1
MASE 6196	Doct. Rsrch Symposium II	1
<b>Research and Elective Courses (Up to 51 hours)</b>		
<b>Fall Semester</b>		
MASE 6191	Individual Studies	1-3
or MASE 6291	Individual Studies	
or MASE 6391	Individual Studies	
MASE 6194	Graduate Research Projects	1-3
or MASE 6294	Graduate Research Projects	
or MASE 6394	Graduate Research Projects	
MASE 6103		
MASE 6195	Doct. Rsrch Symposium I	1
MASE 6196	Doct. Rsrch Symposium II	1
MASE 6390	Contem Topics-Materials Sci/En	3
<b>Spring Semester</b>		
MASE 6191	Individual Studies	1-3
or MASE 6291	Individual Studies	
or MASE 6391	Individual Studies	
MASE 6194	Graduate Research Projects	1-3
or MASE 6294	Graduate Research Projects	
or MASE 6394	Graduate Research Projects	
MASE 6103		
MASE 6195	Doct. Rsrch Symposium I	1
MASE 6196	Doct. Rsrch Symposium II	1
MASE 6340	Advanced Failure Analysis	3
MASE 6343	Advanced Materials/Composites	3
MASE 6390	Contem Topics-Materials Sci/En	3
<b>Dissertation</b>		
<b>Fall Semester</b>		
MASE 6398	Dissertation	3
MASE 6399	Dissertation	3
<b>Spring Semester</b>		
MASE 6398	Dissertation	3
MASE 6399	Dissertation	3