Doctor of Philosophy in Materials Science and Engineering (MS Entry)

About This Program

Doctor of Philosophy in Materials Science and Engineering involves an interdisciplinary and multidisciplinary approach which requires students to complete a set of materials science and engineering core courses augmented by elective offerings in aerospace engineering, biomedical engineering, chemistry, civil engineering, electrical engineering, materials science, mechanical engineering and physics. The degree is a research degree which requires the candidate successfully to carry out independent research in an area acceptable to the Committee on Graduate Studies for Materials Science and Engineering. A student's research is directed by a faculty member from any of the departments or programs participating in the Materials Science and Engineering Program.

Competencies

1. Upon completion, students will demonstrate mastery of both theoretical and experimental concepts in materials science.
2. Upon completion, students will demonstrate a broad understanding of the principles and properties of various classes of engineering materials.
3. Upon completion, students will demonstrate proficiency in conducting independent advanced research, applying critical thinking and analytical skills.
4. Upon completion, students will effectively deliver presentations with confidence, clarity, and strong communication skills.

Admissions Criteria

Doctoral candidates shall demonstrate through previous academic preparation the potential to carry out independent research in materials science and engineering. All applicants must meet the general requirements of the University as stated in the Graduate Admissions (https://catalog.uta.edu/academicregulations/admissions/graduate/) section of this catalog. Applicants not meeting all criteria may be admitted on a provisional or probationary basis.

For applicants with no prior training in engineering or with insufficient undergraduate materials coursework, the same minimum criteria will apply. Additionally, their records will be reviewed in relation to their materials backgrounds, and probationary status with specific remedial work required may be a basis for acceptance of such applicants.

The UT Arlington Materials Science and Engineering Program uses the following guidelines in the admission review process:

UNCONDITIONAL ADMISSION

Applicants meeting the following requirements will be considered for unconditional admission.

1. Minimum undergraduate GPA of 3.3 in the last 60 hours of undergraduate work in an appropriate engineering or science discipline. (For some international applicants where GPA calculation based on a 4.0 scale is not performed, a minimum performance level of 75 percentile is expected. This minimum expectation may be higher for some countries, where less stringent grading criteria are used.) Performance in core materials-related courses is of particular importance.
2. A GRE score of at least 146 (verbal) and 159 (quantitative). For those applicants whose GRE verbal score falls below 146, high TOEFL scores may be considered to offset the GRE verbal score.
3. Three favorable, veracious recommendations, via the university's recommendation form or via recommendation letter.
4. An applicant whose native language is not English must meet the minimum university English language requirements as detailed in the general admission requirements section of the catalog. However, meeting the minimum requirement does not guarantee admission. The program will give preference to students with a TOEFL iBT total score of 84 with sectional scores of 22 for writing, 21 for speaking, 20 for reading, and 20 for listening or an IELTS score of 6.5.

PROBATIONARY ADMISSION

Probationary admission may be permitted when an applicant meets the general admission requirements of the University and any two of the first 3 requirements listed above. Non-native speakers of English TOEFL or IELTS scores will also be considered and must meet or exceed University minimum standards as described above.

PROVISIONAL ADMISSION

An applicant who is unable to supply all required documentation prior to the admission deadline, but who otherwise appears to meet admission requirements, may be granted provisional admission.

DEFERRED

If an applicant does not present adequate evidence of meeting admission requirements, the admission decision may be deferred until admission records are complete or the requirements are met.

DENIAL OF ADMISSION

An applicant may be denied admission if he/she has less than satisfactory performance in two out of three of the first three admission criteria or unacceptable scores on the TOEFL or IELTS.

WAIVER OF GRADUATE RECORD EXAM

A waiver of the Graduate record Exam may be considered for a UT Arlington graduate who graduated within the past three years and has completed an engineering or science degree closely related to materials science and engineering. The student's GPA must equal or exceed 3.0 in each of two calculations:

1. in the last 60 hours of study and
2. in all undergraduate coursework completed at UT Arlington.

The GRE waiver may be extended to include non-UT Arlington candidates that have undergraduate degrees (with GPA of 3.3 or above) from U.S. universities with an ABET accredited engineering program or other select U.S. universities subject to graduate advisor's approval. The waiver of the GRE applies only to applicants for the master's degree programs. Interested applicants should contact the Materials Science and Engineering Graduate Advisor.

ELIGIBILITY FOR SCHOLARSHIPS/FELLOWSHIPS

Students that are admitted will be eligible for available scholarship or fellowship support. Award of scholarships or fellowships will be based on the student's relative standing with respect to other qualified applicants.

Curriculum

Foundations (Core)		
MSE 5300	INTRODUCTION TO MATERIALS SCIENCE AND ENGINEERING [1]	
MSE 5304	ANALYSIS OF MATERIALS	3
MSE 5305	SOLID STATE PHYSICS AND THERMODYNAMICS OF MATERIALS	3
MSE 5312	MECHANICAL BEHAVIOR OF MATERIALS	3
MSE 5321	PHASE TRANSFORMATIONS OF MATERIALS	3
Specialization		
Select at least four of the following.		12
MSE 5315	FATIGUE OF ENGINEERING MATERIALS	
MSE 5316	TRIBOLOGY AND LUBRICATION	
MSE 5320	NANOSCALE MATERIALS	
MSE 5330	CORROSION SCIENCE AND ENGINEERING	
MSE 5333	MAGNETIC PROPERTIES OF MATERIALS	
MSE 5335	ELECTRICAL PROPERTIES OF MATERIALS	
MSE 5341	TRANSMISSION ELECTRON MICROSCOPY IN MATERIALS SCIENCE	
MSE 5345	CERAMIC MATERIALS	
MSE 5350	INTRODUCTION TO COMPUTATIONAL MATERIALS SCIENCE	
MSE 5347	POLYMER MATERIALS SCIENCE	
MSE 5351	CURRENT TOPICS IN NANOTECHNOLOGY	
MSE 5352	SOLAR ENERGY MATERIALS AND DEVICES	
MSE 5353	FUNDAMENTALS OF SUSTAINABLE ENERGY	
MSE 5354	ELECTRONIC MATERIALS AND DEVICES	
MSE 5355	MATERIALS FOR ENERGY	
Other courses with prior approval of graduate advisor and supervising faculty member.		
In consultation with research advisor, select additional electives from chemistry, physics and engineering sufficient to specialize in an academic discipline, subject to approval by the Committee on Graduate Studies for Materials Science and Engineering.		
Seminar Hours		
Complete three hours of the following:		3
MSE 5193	SEMINAR IN MATERIALS SCIENCE AND ENGINEERING	

Research Hours		
Dissertation		
Complete at least nine hours in the following:		9
MSE 6399	DISSERTATION	
MSE 6699	DISSERTATION	
MSE 6999	DISSERTATION	
MSE 7399	DOCTORAL DEGREE COMPLETION	
Total Hours		**36**

[1] MSE 5300 must be taken by any students whose academic backgrounds are different from Materials Science and Engineering. An exemption may be granted by the Graduate Advisor if it is determined that the student has a solid foundation for Materials Science and Engineering. Course credit will not be counted toward the total credits required for graduation. However, the grade will be included in GPA calculations.

Program Completion

MILESTONES

After completion of the first year's coursework (i.e., core courses), students must satisfactorily complete diagnostic examinations which may be written or oral or written and oral with a supplemental interview with faculty members, as determined by the Committee on Graduate Studies in Materials Science and Engineering.

Upon completion of all or nearly all of the coursework requirements and after having demonstrated research ability through partial completion of dissertation research, a student must satisfactorily complete a comprehensive examination.

The dissertation research will be formulated in conjunction with the student's faculty research advisor who may be associated with any of the following academic disciplines participating in the Materials Science and Engineering Program: aerospace engineering, biomedical engineering, chemistry, civil engineering, electrical engineering, materials science, mechanical engineering, and physics. The dissertation research represents the culmination of the student's academic efforts and is expected to demonstrate original and independent research activity and be a significant contribution to knowledge in the field.

Advising Resources

Location:

ELB 231

Email:

mse@uta.edu

Phone:

817-272-2538

Web:

Schedule an appointment (https://www.uta.edu/academics/schools-colleges/engineering/academics/departments/materials-science/)