DOCTOR OF PHILOSOPHY IN MATERIALS SCIENCE AND ENGINEERING

72 credit hours beyond the B.S.

This program provides advanced, research-based education and knowledge through advanced coursework, state-of-the-art and original research, and publication of novel results in preparation for careers in academia and industrial research and development.

The doctoral degree is awarded in recognition of a high level of mastery in one of the several fields of the department including a significant original research contribution. A student working toward the Ph.D. degree has great flexibility in formulating an overall program to meet individual needs under the guidance of an adviser and the department.

Further, the student must be accepted by a thesis adviser and pass a qualifying examination given by the department in order to be admitted to candidacy for the Ph.D. degree. The examination evaluates the student's background in order to determine the student's potential for achieving a doctorate.

The student, in consultation with the adviser, prepares a plan of study to meet individual needs and interests, which must then be approved by the adviser, the department's graduate studies committee, and the department chair. The plan of study usually consists of at least one full year of advanced coursework beyond the master's degree, or equivalent, and a minimum of one full year of thesis research.

After the student essentially completes all coursework, he or she must pass the Ph.D. comprehensive examination. Conducted by the student's thesis advisory committee, this examination must be completed at least one year prior to graduation. Concentrated research to satisfy the requirements of a doctoral dissertation is ordinarily conducted after the comprehensive examination has been passed. The dissertation must be approved by the student's thesis advisory committee. Thesis research should be equivalent to at least one full year's work, corresponding to up to 36 thesis credit hours. This work is performed on campus; the department's graduate studies committee and the Dean of the Graduate College must approve off-campus research. The doctoral dissertation is expected to contain a distinct and substantial original contribution to the student's field of study. After the research has been completed and a preliminary draft of the dissertation is approved, the candidate defends his or her thesis at a final oral examination, which is open to the public.

Curriculum

Code	Title	Credit Hours
Required Courses		(17-18)
Select a minimum of six courses from the following:		17-18
MMAE 461	Failure Analysis	3
MMAE 470	Introduction to Polymer Science	3
MMAE 472	Advanced Aerospace Materials	3
MMAE 501	Engineering Analysis I	3
MMAE 520	Advanced Thermodynamics	3
MMAE 533	Fatigue and Fracture Mechanics	3
MMAE 554	Electrical, Magnetic and Optical Properties of Materials	3
MMAE 561	Solidification and Crystal Growth	3
MMAE 562	Design of Modern Alloys	3
MMAE 563	Advanced Mechanical Metallurgy	3
MMAE 564	Dislocations and Strengthening Mechanisms	3
MMAE 565	Materials Laboratory	3
MMAE 566	Problems in High-Temperature Materials	3
MMAE 567	Fracture Mechanisms	3
MMAE 568	Diffusion	2
MMAE 569	Advanced Physical Metallurgy	3
MMAE 570	Computational Methods in Materials Science and Engineering	3
MMAE 576	Materials and Process Selection	3
MMAE 578	Fiber Composites	3
MMAE 579	Advanced Materials Processing	3
Ph.D. Research		(24-36)
MMAE 691	Research and Thesis Ph.D.	24-36

Minimum degree credits required: 72