

AEROSPACE ENGINEERING AND MECHANICS, PH.D.

Doctor of Philosophy in Aerospace Engineering and Mechanics

The Department of Aerospace Engineering and Mechanics offers a Doctor of Philosophy degree on campus and through an alternative residency (distance learning). In a research-based degree, students are required to propose, complete and defend an approved dissertation on a research topic that contributes to the field of aerospace engineering and/or engineering science and mechanics.

Admissions

In addition to the minimum Graduate School admission requirements, to be considered for regular admission an application must include:

- Three letters of recommendation
- GRE (optional)

AEM department standards are higher than the graduate school minimums, and all application materials are carefully considered. Meeting minimum graduate school requirements does not guarantee admission into the PhD program.

Students applying to the PhD program without a bachelor's or master's degree in aerospace engineering, mechanical engineering, or engineering mechanics are required to complete the following coursework from an accredited university (if not already completed) prior to applying:

- Calculus (12 semester credit hours)
- Ordinary Differential Equations
- 12 semester credit hours of calculus-based engineering mechanics - Statics, Dynamics, Mechanics of Materials and Fluid Mechanics.

Students have the opportunity to enroll in the mechanics courses through the Office of Teaching Innovation and Digital Education as a non-degree seeking (NDS) applicant.

The PhD distance program is open to US students as well as international students residing in the US with appropriate visas. For students interested in the distance PhD program, it is highly recommended to contact faculty with similar research interests and arrange an on-campus visit or video conference prior to applying to the program. Gaining faculty interest and support is essential in the application review.

See the Admission Criteria section of this catalog for more information.

Curricular Requirements

The PhD degree can be earned by completing 42 hours of coursework, 18 hours of dissertation research, and a committee approved dissertation that includes an oral defense and written document. A 3.0 GPA for coursework is required.

Students must complete two core courses, one from each core designation.

AEM Core Courses		Hours
Aerospace Core:		
AEM 569	Orbital Mechanics	3
AEM 582	Space Systems	3
AEM 614	Airfoil and Wing Theory	3
AEM 668	Adv. Flight Dynamics & Control	3
Mechanics Core:		

AEM 500	Intermediate Fluid Mechanics	3
AEM 530	Continuum Mechanics	3
AEM 562	Intermediate Dynamics	3
AEM 637	Theory Of Elasticity	3

Students must also complete six hours of mathematics coursework. Consult with your Research Advisor or the Graduate Program Coordinator regarding approved math courses. Four commonly taken and approved courses are listed in the table.

Common Mathematics Course Options		Hours
GES 551	Matrix And Vector Analysis	3
GES 554	Partial Diff Equations	3
ME 501	Mech Engr Analysis I	3
ST 560	Statistical Methods	3

Elective coursework must be approved by the Research Advisor. Of the 42 coursework credit hours, at least 21 must have an AEM designation.

Curricular Table		Hours
Core Courses		6
Mathematics Coursework		6
Elective Coursework		30
AEM 699 Dissertation Research (minimum)		18
Total Hours		60

Transfer Credit

Transfer credit requests are evaluated by the Graduate School and the AEM department and follow Graduate School policy. The department does support the block transfer option, through the Plan of Study form, of an appropriate MS degree in aerospace engineering, mechanical engineering, or engineering mechanics that meets Graduate School requirements and is approved by their research advisor and the Graduate Program Coordinator.

Doctoral Plan of Study Requirement

The Plan of Study form should be completed within the first year in the program and is required prior to the admission to candidacy. Students must work with their research advisor to complete and submit the Plan of Study. Changes in coursework after a Plan of Study has been submitted and approved will require a new Plan of Study.

Qualifying Exam

Students in the PhD program are required to successfully complete the written qualifying examination based on the student's core coursework and other research-related material as specified by their qualifying exam committee. The qualifying examination may only be taken twice. A student should take the qualifying examination after completing their AEM core courses and at least 50% of the required coursework hours. Passing the qualifying exam is required for formal PhD candidacy and enrollment in dissertation research hours. The written examination is offered twice a year, usually in October and March. The Graduate Program Coordinator coordinates the PhD qualifying examinations.

The student can pass, partial-pass, or fail the written exam. If a partial-pass is earned, then the student must complete an oral exam delivered by the qualifying exam committee prior to the end of the semester. At that time, the committee determines pass or fail. If the student fails the

qualifying exam, then they have one more opportunity to pass the exam. If they fail twice, then they have the potential to complete an MSAEM degree.

Admission to Candidacy Requirements

Admission to Candidacy is determined by either:

- passing the AEM Department Qualification Exam and completing 75% of their coursework hours

OR

- passing the AEM Department Qualification Exam and passing the Dissertation Proposal

Candidacy should be attained by the third year for on-campus students and at least a year before the dissertation defense. An up-to-date Plan of Study detailing courses completed and transferred is required. Students may start enrolling in AEM 699 once they have attained candidacy.

Continuous Enrollment Policy

Graduate School Policy

Dissertation Requirements

On-campus students should form their dissertation committee (minimum of five graduate faculty, the majority from AEM and at least one outside the department) and propose their dissertation topic after passing their qualifying exam and nearing the completion of their coursework.

Dissertation submission deadlines, document formatting, and graduate semester enrollment requirements follow the Graduate School calendar and policy including submitting the Public Notice of a Dissertation Defense form at least two-weeks prior to the scheduled dissertation date. Department requirements include:

- The defense to occur on campus unless a departmental waiver is approved
- The publication of at least one research paper related to the subject of the dissertation prior to signing the Committee Acceptance Form of the Electronic Dissertation

Time Limits For Degree Completion Requirements

Graduate School Policy

Student Progress Requirement

Students are expected to progress through their degree program in a timely manner and with consultation with their advisor.

Academic Misconduct Information

Graduate School Policy

Withdrawals and Leave of Absence Information

Graduate School Policy

Academic Grievances Information

Graduate School Information

Grades and Academic Standing

Graduate School Policy

Graduate School Deadlines Information

Graduate School Information

Application for Graduation Information

Graduate School Policy

Assistantships (teaching and research) are offered by the department and faculty to highly-qualified applicants with preference towards those pursuing a PhD. Most assistantships start in the fall and last one academic year with consideration for renewal. A full assistantship provides a competitive stipend, tuition and health benefits. Assistantships usually do not cover fees related to personal items.

Assistantship offers are contingent upon receipt of acceptable results of a pre-employment background report. To maintain assistantship funding, recipients must register for at least the minimum number of graduate hours, remain in good academic standing, competently and timely perform departmental assigned activities, successfully complete our International Teaching Assistant Program (ITAP) within the first academic year if an international student, and continually progress through the degree program. These criteria are evaluated by your assigned research advisor and the Department Head. Failing to meet or complete any of these criteria can result in the termination of the assistantship but not necessarily dismissal from the program if in good academic standing.

No additional application is necessary to be considered for a departmental assistantship; however, **if seeking an assistantship then it is recommended to submit your application by January 31 or earlier for the ensuing fall semester.** Contacting faculty with similar research interests is encouraged.

Several national, state and university fellowship programs exist, including the University's Graduate Council Fellowship. Students are encouraged to seek these opportunities as well.

For additional information about financial assistance in the AEM graduate programs, contact the Graduate Program Coordinator.