Doctor of Engineering in Aerospace Engineering

Aerospace Engineering

The aerospace engineering discipline involves the design, production, operation, and support of aircraft and spacecraft. Aerospace engineers solve problems, design aircraft and spacecraft, conduct research, and improve processes for the aerospace industry.

Mission

KU Aerospace Engineering is an international leader in aerospace education and is committed to developing a global community of choice for students, educators, and researchers by strategically aligning teaching, research, and service missions. A world-class graduate and undergraduate education focused on designing, simulating, building, testing, and flying aerospace vehicles is provided. The department invests in research infrastructure and chooses outstanding students, faculty, and staff to conduct basic and applied research of relevance to aerospace vehicles and systems. The department supports the aerospace profession by educating the public, by maintaining the KU aerospace short-course program, and by advising policy-makers in government, industry, and disciplinary professional organizations.

Educational Objectives

Aerospace engineering prepares graduates for professional practice in the aerospace industry and graduate study in aerospace engineering. Achievement is measured through assessment of the performance of graduates three to six years after graduation. Graduates must demonstrate the following measurable learning outcomes:

1. Competence in the analysis, test, and design of aerospace systems and components using contemporary techniques, equipment, and software.
2. An understanding of the professional responsibilities associated with the special public safety and economic aspects of the aerospace industry.
3. The ability to communicate analysis test, and design results to engineers and nonengineers.
4. The ability to work effectively in interdisciplinary teams.
5. An understanding of the need for lifelong learning.

Graduate Admission to the Department of Aerospace Engineering

Application Requirements

In order for applications to be considered complete, the following materials must be submitted online with the application by the posted deadline:

1. Transcripts from all degree granting institutions (If admitted, official transcripts must be sent for all applicants - including KU undergraduate students). In order for transcripts to be considered official, they must be sent directly from the institution either by mail or e-mailed directly to the University of Kansas. KU does not consider transcripts that come from applicants or that have been in the applicant's possession as official. You may be admitted by the department with the transcript uploaded to your application; however, University Graduate Admissions must receive the official transcripts - sent directly from your institution – before you will be officially admitted to the university. Degree conferral transcripts must be received by the end of your first semester of graduate enrollment to be eligible to continue enrollment. The official transcripts must show that your undergraduate degree has been conferred.
2. Three letters of recommendation. Recommenders will receive instructions on submission at the time the application is submitted.
3. Resume or CV
4. Official GRE score report
5. Statement of Objectives form (included in the application)
6. Official TOEFL, IELTS, or PTE score report (International students only)
7. Statement of Financial Resources (International students only)

* Please note: All application materials must be received before any kind of decision is made. Documentation sent in addition to that requested above is not required and may be destroyed. Do not send paper documents unless requested.

Admissions Deadline

Our department priority deadlines for admission are:

Fall Admission: December 1 (all applicants)
Spring & Summer Admission: September 15 (all applicants)

For full consideration for fellowships, scholarships and research/teaching assistantships, applications should be received by December 1 (for fall admissions). Application materials should indicate the interest in financial assistance or research/teaching assistantships.

Application Fees

Domestic: $65
International: $85

Document Specifications

Letters of Recommendation

The letter of recommendation form should be completed and sent with a signed document from your chosen references. Recommenders will receive instructions on submission at the time the application is submitted.

Statement of Objectives

To complete the Statement of Objectives Form, the essay should be no longer than the space provided. The Statement of Objectives form is included in the online application.

Statement of Financial Resources

As a part of the application process, all international students must submit credible evidence of financial support for the first year of study (http://iss.ku.edu/cost-sheets). Financial documents must be less than 6 months old, indicating the type and amount of currency in US dollars. If the bank account is not in the applicant's name, please attach a statement signed by the account holder indicating the relationship to the student for whom the support will be provided. There is no form for the Statement of Financial Resources, please send only the form(s) of documentation listed below.

Acceptable evidence includes:
• Bank statement from checking, savings, stock holdings and/or certificate of deposit.
• Bank letter on letterhead indicating date account opened, average balance and current balance.
• Scholarship or sponsorship letter verifying amount, source and dates of award.

Admissions Standards
Students who wish to apply for admission to the Aerospace Engineering graduate program must have, as a minimum, a BSAE degree or a BS degree in a closely-related field from a university or college with a program equivalent to the KU BSAE program. Students applying with either a BS degree from an engineering program that is not equivalent to the KU BSAE program, or a BS degree from a non-aerospace engineering program may have to make-up certain undergraduate AE courses at the discretion of the department graduate advisor. Such students will be admitted provisionally until a plan of study for make-up courses is completed.

Regular Admission
Master's program regular admission requires an undergraduate GPA of at least a 3.0.

Doctoral program regular admission requires an undergraduate GPA of at least 3.0 and a GPA of at least 3.5 for courses taken as part of a master's program.

Provisional Admission
International students are not eligible for provisional admission due to Department of Homeland Security requirements.

In exceptional cases, applicants with a GPA between 2.75-2.99 may be granted provisional admission. Students with educational backgrounds other than aerospace engineering may be admitted provisionally.

Provisional students must achieve a 3.0 GPA by the end of their first semester. Failure to achieve the minimum GPA can result in dismissal. In extenuating circumstances, a student may be allowed to continue provisionally for one additional semester.

Students admitted provisionally are not eligible to hold GTA or GRA appointments.

Transfer Credit for Graduate Courses
Up to six hours of approved graduate work may be transferred to KU from other universities. Students with a B.S. degree from KU may transfer up to eight hours of approved graduate work from other universities.

GRE Requirements
Applicants must have a minimum of 50% on the Verbal and Analytical sections of the GRE and 85% on the Quantitative section. Applicants with lower scores, but otherwise exceptional record, will be considered for provisional admission.

English Proficiency Requirement
International students and students who indicated English as a second language, are required to show proof of English proficiency for admission purposes and must check-in at the Applied English Center (http://www.aec.ku.edu) (AEC) upon arrival on campus for orientation. This process serves to confirm each student’s level of English proficiency and determine whether English courses will be included as a requirement of the student’s academic program. Note: Students who demonstrate English proficiency at the waiver level or who have earned a degree from one of the specified English-speaking countries listed in the policy (http://policy.ku.edu/graduate-studies/english-proficiency-international-students) are not required to check in at the AEC (see eligibility requirements on the Graduate Studies website (https://graduate.ku.edu/english-proficiency-requirements)).

Refer to link (http://policy.ku.edu/graduate-studies/english-proficiency-international-students) for university policy.

Funding
Scholarships/Fellowships - The Aerospace Engineering department nominates applicants for University and School of Engineering scholarships and fellowships based on academic merit and other selection criteria.

Graduate Teaching Assistantships (GTAs) - Teaching Assistantships are available and are awarded competitively based on academic qualifications through the department or school.

Graduate Research Assistantships (GRAs) - Students work with their potential academic advisor/mentor to obtain a funded position on a research project.

*Important note: acceptance into the graduate program DOES NOT guarantee financial aid. To be considered for financial aid, applications must be received by the priority deadline.

A variety of scholarships, fellowships, and assistantships are available to graduate students through the School of Engineering and KU. Learn more at http://www.engr.ku.edu/prospective/graduate/scholarships.html

Visit Us
The graduate program staff is happy to work with all prospective students in determining the fit between the student and the program. In order to determine this, we feel that visiting our campus in Lawrence is a very important step. In order to facilitate your visit to KU, there are two main options:

The first, and most preferred, option entails simply applying for admission to the program. All prospective students are welcome to attend our Open House in early November and some highly qualified admitted students may be invited to participate in Campus Visit Days in late February or early March (prior to the fall semester of your intended matriculation). These organized visitation opportunities will allow you time to gather a great deal of first-hand information which we hope will help you in making a final decision about whether to attend KU.

The second option is making arrangements to visit us on your own, outside of organized events. With early notification, we will do our best to work with you to provide information and schedule appointments with faculty when possible. Please contact us if you feel that this is the best option for you.

Contact Information
Please contact the AE Graduate Program Manager at aerohawk@ku.edu or (785) 864-2960, to schedule a visit or with questions about the application process.
Doctor of Engineering in Aerospace Engineering

The Doctor of Engineering emphasizes systems design and management skills and requires 66 credit hours beyond the B.S degree. These 66 hours consist of 36 credit hours of course work, 18 credit hours of project and 12 credit hours of industrial internship.

Core courses of at least 9 credit hours of graduate mathematics beyond the B.S. are required. The 9 credit hours must include a minimum of 6 credit hours of graduate-level courses from the Mathematics Department. AE 712 is considered a mathematics-intensive engineering course. Graduate mathematics courses are MATH 590 or any other math course 600-level or above.

Breadth courses consist of 12 credit hours distributed outside the area of specialization in aerodynamics, structures and materials, dynamics and controls, design, propulsion and astronautics.

Depth courses consist of 15 credit hours of technical courses (600-level and above) in the area of specialization.

Credit hours earned completing a master’s degree can satisfy a portion of these requirements when appropriate. Unique situations can be accommodated with the approval of the graduate advisor and the major professor.

In addition to general rules and regulations, a student must meet the following departmental requirements. After 2 semesters following completion of M.S. or M.E. requirements (or at a comparable level for non-M.S. or non-M.E. students), the student is evaluated. To be allowed to continue, the student must

1. Have a minimum grade-point average of 3.5 in M.S. course work, and
2. Pass the Doctoral Qualifying Exam (DQE)

The DQE tests breadth of knowledge and determines the student’s ability to formulate mathematical representations of real physical situations. The examination covers mathematics and 2 of these 5 areas:

- Aerodynamics,
- Astronautics,
- Structures and materials
- Dynamics and controls, and
- Propulsion.

A student is allowed only 2 attempts to pass this examination. If a student has completed AE 712 with a grade of B or higher, the mathematics section of the qualifying exam is waived.

The aspirant forms a project committee and completes a Plan of Study after the first semester and before the end of the second semester. The project committee must have at least 5 members, including 3 tenured or tenure-track faculty from aerospace engineering and at least 1 member from engineering management. The committee approves the aspirant’s program and administers the comprehensive examination and the formal oral defense and project.

When the aspirant has completed most of the course work and satisfied the research skills, responsible scholarship and residency requirements, he or she must take the comprehensive examination. Before being admitted to the comprehensive examination, the aspirant must satisfy the department’s basic research skills, responsible scholarship and residency requirements. The research skill requirement provides the aspirant with a research skill distinct from, but strongly supportive of, the dissertation research. One research skill is required. Possible research skills include computer science, mathematics, statistics, specific laboratory skills, and specific skills in the physical or biological sciences. The selected research skill must be listed on the Plan of Study form. A separate statement attached to the Plan of Study must list the work to be completed to obtain the research skill. The responsible scholarship requirement serves to ensure that students are trained in responsible research practices. Aspirants can satisfy the responsible scholarship requirement by enrolling in 2 semesters of AE 690, Professional Development for Graduate Students. This course covers ethical behavior for graduate students, intellectual property, and technical writing. The residency requirement is met by completing 2 semesters, which may include 1 summer session, in resident study and enrollment in 6 credit hours or more. During the period of residence the student must be involved full time in academic pursuits, which may include up to half-time teaching or research.

The comprehensive exam is made up of two parts. The first part must consist of a written project proposal outlining in some detail the work to be done for the project. The second part is an oral examination in which she or he must defend the project plans and demonstrate competence in his or her particular and related areas. Upon passing the comprehensive examination, the aspirant becomes a candidate for the D.E. The project committee directs preparation of the approved project topic. A formal oral and public defense of the project is required before the committee, any other interested members of the Graduate Faculty, and the general public. Candidates for the D.E. must satisfy the university’s general requirements for the degree.

A 12-month continuous internship in an industrial or governmental organization is required before assumption of the project responsibilities. This internship must be under joint guidance of a preceptor, who is appointed to the adjunct faculty and a regular faculty member. The internship requirement cannot be satisfied by working in any KU facility.

Because the internship is a degree requirement and because KU cannot guarantee internship employment, the student must indicate in writing how the internship requirement is to be satisfied before completing the first semester after passing the qualifying examination. This can be a letter from the faculty advisor indicating a grant availability, notice of a project appointment or assignment, or a letter from a company or agency (U.S. or abroad) expressing willingness to sponsor the student in an internship.

To be awarded the D.E. degree in Aerospace Engineering all the following requirements must be satisfied:

1. Complete all D.E. course requirements with a GPA of at least 3.50. Grades of C-, D, and F are not allowed.
2. Pass the Doctoral Qualifying Examination.
3. Complete the Research Skills and Responsible Scholarship requirements.
4. Satisfy the residency requirements.
5. Pass the Comprehensive Exam.
6. Prepare and defend an approved D.E. project report which must contain an original contribution to the field by the candidate.

Maximum Tenure

The dissertation must be completed within eight years after being admitted to the D.E. program in AE. In cases which require more than
eight years, the dissertation committee may grant an appeal for an extension of this period.