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. **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 you uploaded to the application; however, University Graduate Admissions must receive your official transcript - 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 transcript must show that your undergraduate degree has been conferred.
2. Three letters of recommendation with completed form (Graduate Letter of Recommendation Form (http://ae.engr.ku.edu/sites/ae.drupal.ku.edu/files/docs/KU%20Recommendation%20for%20Graduate%20Admission.pdf)). Recommenders will receive instructions on submission at the time the application is submitted.
3. Resume or CV
4. GRE score report
5. Statement of Objectives Form (Statement of Objectives Form (http://ae.engr.ku.edu/sites/ae.drupal.ku.edu/files/docs/Statement%20of%20Objectives%20Form.pdf))
6. TOEFL or IELTS 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 15 (all applicants)
Spring Admission: September 30 (all applicants)
Summer Admission: April 1 (all applicants)

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

Application Fees

Domestic: $55
International: $75

Document Specifications

Letters of Recommendation

The letter of recommendation form should be completed and sent with a signed document from your chosen references (Graduate Letters of Recommendation Form (http://ae.engr.ku.edu/sites/ae.drupal.ku.edu/files/docs/KU%20Recommendation%20for%20Graduate%20Admission.pdf)). Recommenders will receive instructions on submission at the time the application is submitted.

Statement of Purpose

The essay should be brief and to the point.

Statement of Financial Resources

As a part of the application process, all students must submit credible evidence of financial support for the first year of study (http://affordability.ku.edu/cs/?initial=grads). 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. Applications cannot be submitted for
consideration without the proper financial documentation.

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

Contact Information

Aerospace Engineering Graduate Director:

Graduate Program Director
The University of Kansas
Aerospace Engineering
2120 Learned Hall
1530 W. 15th Street
Lawrence, Kansas, 66045

E-mail Graduate Program Director, Dr. Charlie Zheng, at
aerohawk@ku.edu

KU Office of Graduate Studies:

The University of Kansas
Graduate Applications Processing Center
1450 Jayhawk Blvd. Room 313
Lawrence, Kansas 66045-7535
785-864-8040

E-mail the main university Office of Graduate Studies at
Graduate@ku.edu or contact the School of Engineering Research &
Graduate Studies office at GradEngr@ku.edu with general questions
about admission.

KU (http://www.graduate.ku.edu) Graduate Studies Website (http://
www.graduate.ku.edu)

Admissions Standards

Minimum Requirements for Doctoral Applicants

Students applying for admission to the Ph.D. or D.E. programs must have
as a minimum an M.S. or M.E. in Aerospace Engineering, unless they are
admitted on a Fast Track basis with a bachelor degree in engineering.
The department graduate advisor will evaluate the total academic
preparation to determine if additional courses are required to prepare the
student for graduate work in aerospace engineering. Any undergraduate
courses which must be taken do not carry graduate credit. Internships are
not guaranteed.

Except for BSAE, MSAE or MEAE graduates from KU, all applicants must
supply a recent Graduate Record Examination (GRE) and three letters of
recommendation from individuals familiar with their academic record and
performance. Applicants must have as a minimum a GPA of 3.5/4.0 for all
courses taken during their M.S. or M.E. program.

GPA Requirements

Applicants must have a minimum GPA of 3.0 for a regular admission
status. In exceptional cases applicants with a GPA between 2.75-2.99
may be granted provisional admission. In such instances the student must
maintain a GPA of at least 3.0 during the first semester of graduate study
at KU. Grades of D and F are not accepted. A student failing to maintain
these standards will be dismissed from the graduate program. On rare
occasions and as supported by other strong evidence of achievement
(e.g., significant industrial experience), a provisional admission status
may be granted to students with a cumulative GPA below 2.75. After one
semester of full-time graduate studies and maintaining a GPA of at least
3.0, a provisionally-admitted students must file a petition to change his/her
status to regular status.

Applicants from outside KU must submit Graduate Record Examination
(GRE) scores and three letters of recommendation from individuals
familiar with their academic performance.

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.

Non-English Speaking Students

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

Receipt of an official copy (not student's copy) of an applicant's English
proficiency standardized test scores (e.g. TOEFL) achieved not more than
two years prior to the semester of first enrollment.

All students who are not native speakers of English and/or international
students and who are admitted to campus-based programs are required
to check in at the Applied English Center (http://www.aec.ku.edu) (AEC)
upon arrival on campus. At that time, the AEC will confirm the student's
level of English proficiency and determine if English courses are required.

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.

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
English Proficiency Requirement

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

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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 Visitations 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 Program Assistant at aerohawk@ku.edu or (785) 864-4267, to schedule a visit or with questions about the application process.

The University of Kansas
Department of Aerospace Engineering
Learned Hall
1530 W. 15th St., Room 2120
Lawrence, KS 66045-7618

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. Breadth courses of at least 12 credit hours must be distributed outside the area of specialization in aerodynamics, structures and materials, dynamics and controls, design, propulsion and astronautics. Depth courses of at least 15 credit hours of technical courses (600 and above) in the area of specialization are required.

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 mathematics courses. AE 712 is considered a mathematics-intensive engineering course. Graduate mathematics courses are MATH 590 or any other math course 600 level or above.

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,
2. Pass a qualifying examination, and
3. Submit a Plan of Study.

The qualifying examination 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.

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 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.