Bachelor of Science in Architectural Engineering

B.S. in Architectural Engineering Program

Students in the B.S. in architectural engineering (ARCE) program are admitted by and must fulfill the graduation requirements of the School of Engineering. The program is administered by the School of Engineering’s Department of Civil, Environmental, and Architectural Engineering (CEAE).

In KU’s ARCE program students learn to analyze and design the engineered systems that make buildings perform their intended functions. At KU the ARCE areas of emphasis are:

1. Structural design and analysis,
2. Building mechanical and energy systems,
3. Illumination and power systems,
4. Construction management, and
5. A hybrid such as sustainability, acoustics, or fire protection.

To use this knowledge, the graduate must have a good foundation in engineering science and design as these relate to building engineered systems and construction, as well as an appreciation for architectural design and history.

B.S. ARCE Mission Statement

Graduates who pursue a career in Architectural Engineering will be successfully engaged in professional engineering practice or graduate study in the analysis, design, construction, and operation of building engineered systems.

Accreditation

The Bachelor of Science in Architectural Engineering is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org.

Careers

Professional Registration and Licensing

Architectural engineers are involved in building projects that directly affect the production, comfort, health and safety of the public. Graduates are strongly encouraged to become registered professional engineers as soon as possible after graduation. In Kansas, and many other states with similar registration laws, this involves completing an ABET-accredited B.S. degree in architectural engineering, passing the Fundamentals of Engineering (FE) and Professional Engineering (PE) examinations, and obtaining four years of satisfactory engineering experience under the supervision of a professional engineer. Students in architectural engineering must take the FE examination before graduation. Architectural engineering graduates can also practice as architects after completing an NAAB-accredited professional undergraduate or graduate architecture degree program and becoming registered architects. Students with this interest should consider the available tracks leading to a Master of Architecture degree in addition to their B.S. in architectural engineering.

Professional Opportunities

Architectural engineering focuses on building engineered systems analysis and design, including structural, mechanical and energy systems, illumination, power, and construction methods applied to buildings. Increasingly, architectural engineers are interested in specializations such as energy efficient buildings, acoustics, and fire protection. Architectural engineers center their attention on the performance, safety, sustainability, cost-effectiveness, and construction of these systems. They typically work for engineering consulting firms, construction companies, or government agencies.

Undergraduate Admission to the School of Engineering

Admission to the KU School of Engineering (and its degree programs) is selective.

Students may be admitted to an engineering or computer science degree program (http://engr.ku.edu/sites/engr.drupal.ku.edu/files/docs/pdfs/Majors_and_Curriculum_Guide_2014_Online.pdf) as freshmen (first year) students, but all admissions, for both in-state and out-of-state students, are selective. Applications are judged on several factors, such as high school record, scores on national tests, academic record at college or university level, and trend of grades and more. High school transcripts and ACT scores (or equivalent SAT scores) are required.

Minimum Academic Standards for Admission

To be considered for admission to the School of Engineering, beginning first-year students must meet or exceed the following minimum standards:

- Must be admissible (http://admissions.ku.edu/apply/requirements/usfreshmen) to the University of Kansas by assured admissions or individual review AND
- Have a 3.0+ GPA AND
- Have a mathematics ACT score of 22 (or math SAT score of 540).

Important: Simply meeting these requirements won’t guarantee admission to a School of Engineering degree program. Students who perform beyond these minimums will have a better probability of being admitted to their selected major.

Minimum Academic Standards for Direct Admission into Degree Program for incoming Freshmen

Students with a 26+ Math ACT (600+ Math SAT) or meet eligibility requirements for MATH 125 (Calculus I) (http://catalog.ku.edu/liberal-arts-sciences/math/#undergraduatetext) may be admitted directly into their chosen major, with the exception of those seeking admission into an EECS program. Electrical Engineering, Computer Science, Computer Engineering, and Interdisciplinary Computing students must have a 28+ Math ACT (640+ Math SAT) or eligibility for MATH 125 for direct admission.

First-Year General Engineering Program

Students with a 22-25 Math ACT (540-580 Math SAT) or meet eligibility requirements for Math 104 (Pre-Calculus) (http://catalog.ku.edu/liberal-arts-sciences/math/#undergraduatetext) are admitted to the School of Engineering First-Year Experience non-degree program for undergraduate students.
First-year Engineering students have one academic year (two semesters and one summer) to transition into a degree program. Admission to a degree program is possible after one of the following is met:

- Complete 12+ credit hours at KU, earn a "B" or higher in Math 104 (Pre-Calculus), earn a "C" or higher in all science and engineering courses, and earn a KU GPA of 2.5+ OR
- Earn a "C" or better in MATH 125 (Calculus I), earn a "C" or better in all science and engineering courses, and earn a KU GPA of 2.5+

### Exploring Engineering

Students not admitted directly to the School of Engineering or their major but who are admissible to the university may be admitted to the College of Liberal Arts and Sciences as an Undecided student. They can later re-apply to the School of Engineering during the semester they are completing the admission requirements for transfer students.

### Transfer Admission Standards

Applications from all transfer students, whether from other institutions or from other academic schools at the University of Kansas, are evaluated on a case-by-case basis. Transfer students must be admissible to KU AND have a cumulative college transferable grade-point average of 2.5+ to be considered. In addition, students must have grades of "C" or better in those courses in math (must include MATH 125 Calculus I or equivalent), science, and engineering applicable to the engineering degree.

Students interested in the Information Technology program are admitted as juniors. They must have completed 60 hours of pre-requisite courses including foundational courses in math, science, and computer science and have a 2.5+ cumulative GPA or better. The Information Technology program resides at the Edwards Campus in Overland Park, KS. Click here for more information.

Current KU Students admitted to other academic units may apply to the School of Engineering by completing a Change of School form. This must be turned in to the School of Engineering Dean's Office by the appropriate deadlines indicated below.

### Already Applied to KU, But Not Engineering?

Don’t worry. It’s not too late to change your mind if you’ve already applied to KU and selected a major outside the School of Engineering. If you think one of the 12 engineering or computer science majors is a better fit for your talents, you can still change your requested major — preferably before May 1 — and be considered for admission to the School of Engineering and all the benefits that go with it.

To update your application, visit Undergraduate Admissions and click on “Change application term, major, mailing address, and/or email address.”

Please contact a member of our recruitment team (studyengineering@ku.edu), 785-864-3881, if you have any difficulty.

### Application Deadlines For New Freshman and Transfer Applicants

<table>
<thead>
<tr>
<th>Semester</th>
<th>Applicants</th>
<th>Deadline</th>
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<tbody>
<tr>
<td>September 15</td>
<td>Priority deadline</td>
<td>for current KU students to apply for spring admission to Engineering.</td>
</tr>
<tr>
<td>November 1</td>
<td>Final deadline</td>
<td>for scholarship consideration for incoming freshmen planning to enter in fall or summer semesters.</td>
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<tr>
<td>December 1</td>
<td>Final deadline</td>
<td>to apply for the Self Engineering Leadership Fellows Program for incoming freshmen</td>
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<tr>
<td>February 1</td>
<td>Final deadline</td>
<td>for scholarship consideration for transfer students planning to enter in fall or summer semesters. Applications available for the Engineering Learning Community</td>
</tr>
<tr>
<td>February 15</td>
<td>Priority deadline</td>
<td>for current KU students to apply for summer or fall admission to Engineering.</td>
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<tr>
<td>May 1</td>
<td>Enrollment Deposit</td>
<td>due.</td>
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### Architectural Engineering 4-Year Graduation Plan

The following are recommended enrollments:

#### Freshman

<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCE 101</td>
<td>2</td>
<td>ARCE 217</td>
<td>3</td>
</tr>
<tr>
<td>ARCH 108</td>
<td>6</td>
<td>ARCH 281</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 101 (KU Core GE 2.1)</td>
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<td>ENGL 102 (KU Core GE 2.1)</td>
<td>3</td>
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<tr>
<td>MATH 125 (KU Core GE 1.2)</td>
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<td>MATH 126</td>
<td>4</td>
</tr>
<tr>
<td>Elective KU Core GE 2.2, GE 3S, AE 4.1, or AE 5.1</td>
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<td>PHSX 210 (KU Core GE 1.1)</td>
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<tr>
<td>Elective KU Core 3S, GE 3N, or AE 5.1</td>
<td>PHSX 216</td>
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<td></td>
<td>18</td>
<td>17</td>
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#### Sophomore

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<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>CE 301</td>
<td>5</td>
<td>ARCE 350</td>
<td>3</td>
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<tr>
<td>CHEM 130 or 150 (KU Core GE 3N)</td>
<td>5</td>
<td>CE 310</td>
<td>4</td>
</tr>
<tr>
<td>MATH 127</td>
<td>4</td>
<td>ME 312</td>
<td>3</td>
</tr>
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Bachelor of Science in Architectural Engineering Degree Requirements

A total of 132 credit hours is required for the degree. Substitutions may be made only by submitting a petition to the academic advisor for the department's and school's consideration. The student's design experience is developed throughout all four years of the undergraduate curriculum, beginning with the introductory course and continuing with required architectural, structural, illumination, power, HVAC, and construction management courses. Each student also takes an elective course in his or her selected emphasis; a list of elective courses is available on the CEAE website (http://www.ceae.engr.ku.edu). In the fourth year, an ARCE capstone design course is required; it integrates the overall design experience for the student.

Students who want to earn a professional Master of Architecture degree in addition to the B.S. in architectural engineering should apply for the “Track III Professional” program via the School of Architecture and Design and discuss it each year with their ARCE advisor so that electives can be chosen carefully.

Mathematics (20)
- MATH 125 Calculus I (GE 1.2) 4
- MATH 126 Calculus II 4
- MATH 127 Calculus III 4
- MATH 220 Applied Differential Equations 3
- MATH 290 Elementary Linear Algebra 2
- MATH 526 Applied Mathematical Statistics I 3

Basic Sciences (13)
- PHSX 210 General Physics I for Engineers 3
- PHSX 216 General Physics I Laboratory 1
- PHSX 212 General Physics II 3
- PHSX 236 General Physics II Laboratory 1
- CHEM 130 General Chemistry I 5
  or CHEM 150 Chemistry for Engineers

English (6)
- ENGL 101 Composition (GE 2.1) 3
- ENGL 102 Critical Reading and Writing (GE 2.1) 3

Humanities/Social Science/KU Core (18)
- ARCH 540 Global History of Architecture I: Origins to Industrial Revolution (3500 BCE-1700 CE) (GE 3H) 3
- ARCH 541 Global History of Architecture II: From Industrial Revolution to Present (1700 CE-Present) (AE 4.2) 3
- GE 2.2 Oral Communication 3
- GE 3S Social Science 3
- AE 4.1 Human Diversity 3
- AE 5 Ethics and Social Responsibility 3

Engineering Science (34)
- ARCE 217 Computer-Assisted Building Design 3
- CE 301 Statics and Dynamics 5
- CE 310 Strength of Materials 4
- ME 312 Basic Engineering Thermodynamics 3
- CE 461 Structural Analysis 4
- EECS 315 Electric Circuits and Machines 3
- ARCE 350 Building Materials Science 3
- CMGT 457 Construction Project Management 3
- CE 330 Fluid Mechanics 3
  or ME 510 Fluid Mechanics 3
- ARCE 660 Building Thermal Science 3

Engineering Design (26)
- ARCE 101 Introduction to Architectural Engineering 2
- CMGT 500 Construction Engineering 3
- ARCE 640 Power Systems Engineering I 3
- ARCE 650 Illumination Engineering 3
- ARCE 661 HVAC&R Systems Design 3
- CE 562 Design of Steel Structures (AE 6.1) 3
- CE 563 Design of Reinforced Concrete Structures 3
- ARCE 698 Comprehensive Design Project 3
- Engineering Science or Engineering Design 3

Architectural Design (15)
- ARCH 108 Architectural Foundations I 6
- ARCH 281 Design Workshop II: Design Thinking 3
- ARCH 509 Architectural Design IV 6

Total Hours: 132

Credit for ROTC Courses. KU ROTC courses that have been approved as KU core courses may count toward the degree.