

**ARCHITECTURAL ENGINEERING
UNDERGRADUATE GUIDE**

***BACHELOR OF SCIENCE
IN ARCHITECTURAL
ENGINEERING
(BS ARCE)***



THE UNIVERSITY OF KANSAS

CEAE DEPARTMENT

***Revised
August 2019***

Our B.S. ARCE Program Educational Objective:

***To prepare students for professional engineering practice
or graduate study in the analysis, design, construction,
and operation of building systems***

Mailing Address:

The University of Kansas
Architectural Engineering Program
CEAE Department, Learned Hall
1530 W. 15th Street, Room 2150
Lawrence, Kansas 66045-7618

Office: 2150 Learned Hall
Phone: (785) 864-3766
Fax: (785) 864-5631

Website:

www.ceae.ku.edu

KU ARCHITECTURAL ENGINEERING PROGRAM

UNDERGRADUATE GUIDE¹

Welcome to the University of Kansas (KU), the School of Engineering (SOE), the Civil, Environmental, and Architectural Engineering (CEAE) Department, and the Architectural Engineering (ARCE; pronounced Arc-E) Program! The faculty, staff, and your fellow students know that your time with us will be challenging as well as very rewarding. We work together as a team to provide high quality educational and research experiences for all. Our faculty prepared this *Guide* to help you become a successful member of our community and to complete your degree requirements efficiently.

The Architectural Engineering Program

The Program was founded in the 1912-13 academic year and has awarded the Bachelor of Science in Architectural Engineering (BS ARCE) degree since 1914. The first female graduate of the School of Engineering, Julia Carman, earned a BS ARCE in 1920. Our Master of Science in Architectural Engineering (MS ARCE) degree has been offered since 1955. In 1999, a Master of Construction Management (MCM) degree was added and later the CMGT course designator was created. The ARCE Program offers an accredited undergraduate degree in architectural engineering. The program's accreditation is by the Engineering Accreditation Commission (EAC) of the Accreditation Board of Engineering and Technology (ABET) and has been continuously accredited since 1936. In 2001 KU Architectural Engineering merged with Civil and Environmental Engineering to form the Civil, Environmental, and Architectural Engineering (CEAE) Department. The CEAE Department has 31 professors, several lecturers and support staff. The Department's Chair is Prof. David Darwin. The Associate Department Chair for Undergraduate Studies is Prof. Mario Medina.

Program Administration

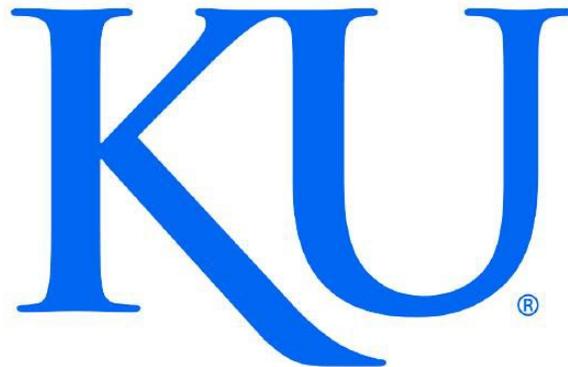
Admission to the program is handled by the School of Engineering. After being admitted, your progress-to-degree is overseen by the CEAE Department and the School of Engineering. For example, every semester after you see your advisor you will submit a completed advising form to Ms. Reta Solwa in 2148c Learned Hall to have your SOE advising-hold released. This release is required for you to enroll on-line. Your final degree requirements-check will also be performed by the SOE after you submit your on-line Application for Degree. The Dean of the School of Engineering is Prof. Arvin Agah. The Associate Dean for Undergraduate Studies is Prof. Susan Williams. Ms. Dawn Shew is SOE's Director of Undergraduate Academic Services. Day-to-day administrative duties are handled by the faculty and staff of the CEAE Department. However it is your responsibility to know and follow all the rules and policies of the University, the School of Engineering, the CEAE Department, and the ARCE Program. For example make sure that you meet the required deadlines for advising, enrollment, tuition and fee payments, and graduation. You can find these various rules and policies from sources such as the University's *Undergraduate Catalog* (www.ku.edu/academics/catalogs/), and/or the on-line *Academic Calendar* (registrar.ku.edu/calendar).

¹ This Guide is intended to help admitted students complete their degree requirements in the University of Kansas Architectural Engineering Program. The Guide is periodically reviewed and revised. The rules and policies found in this document do not supersede those of the University, the School of Engineering, the Civil, Environmental, and Architectural Engineering Department or the School of Architecture & Design.

Summary of Significant Events Toward Your Bachelor's Degree

- Be admitted to the BS ARCE degree program (start at <https://enr.ku.edu/visit>)
- Attend a summer orientation session (strongly recommended)
- Be advised and enroll for each semester
- Study hard and earn a good grade point average (GPA)
- Join the umbrella Architectural Engineering Institute (optional, but strongly recommended)
- Join the professional society of your area of interest (optional, but strongly recommended)
- If invited to, join honor societies (optional, but strongly recommended)
- Explore summer engineering internship opportunities (optional, but recommended)
- Submit an Application for Degree on-line (“Apply for Degree”) during the advising period before the semester in which you plan to graduate
- Take the Fundamentals of Engineering (F.E.) Exam no later than your last semester (required for graduation by the Department)
- Take the Graduate Records Exam (GRE) early in the semester before your last (recommended to keep graduate study as an option)
- Apply for Graduate School and/or seek employment during your last year
- Complete your course requirements (last 30 credit-hours must be at KU)
- Participate in the School of Engineering’s graduation recognition ceremony (optional)
- Walk down the hill in the University's May graduation ceremony (optional)
- Give the KU Alumni Association your forwarding address (optional)

Congratulations. You are now one of our valued alumni!



BS ARCE DEGREE REQUIREMENTS

Curriculum

To obtain your Bachelor of Science in Architectural Engineering (BS ARCE) degree you must complete at least 132 credit-hours of coursework. You will work closely with your advisor each semester to optimize your course selections. You are encouraged to keep on track.

You are required to complete the courses listed on the version of the curriculum under which you were admitted or readmitted. The current version of the ARCE curriculum is located at:

<https://ceae.ku.edu/sites/ceae.ku.edu/files/docs/BSARCEFA19v2.pdf>

The corresponding flowchart is located at

<https://ceae.ku.edu/sites/ceae.ku.edu/files/docs/ARCEFlowchartFA2018rv.pdf>

As the profession changes, the faculty may adjust the curriculum. You can choose to complete your degree under either a revised or your original curriculum, as long as you remain continuously enrolled. Faculty members are very interested in your suggestions and post-graduation experiences that would be helpful for future revisions of the curriculum and course content.

Advising

You will receive enrollment information for each upcoming semester via e-mail. *Be sure that KU has your current KU E-mail address, phone number, and local and permanent postal addresses, and check for messages frequently!* You can update your contact information at 121 Strong Hall or on-line (via registrar.ku.edu/changing-information).

The CEAE Department schedules advising appointments during a two-week period each semester, so when you receive your enrollment instructions from KU you must come to Learned Hall to sign up for a time slot with your assigned advisor. Check the list posted on the CEAE website <https://ceae.ku.edu/advising> and click on the Advising List under Links, just before and during advising periods, to see if your advisor has changed. You must meet with your assigned advisor; however, you can request a different one if, for example, you change your ARCE area of interest. Request a change of advisor via Ms. Reta Solwa at rsolwa@ku.edu. During advising periods advisors will either have sign-up sheets posted on their office doors or contact you by email to make an appointment. Advising for the spring semester is usually just after Fall Break. The advising period for the summer session and fall semester normally occurs immediately after Spring Break.

Before you meet with your advisor each semester you should review this *Guide*, the curriculum, the *Electives List*, and the current *Schedule of Classes* (classes.ku.edu) to refamiliarize yourself with your degree requirements, and to determine what courses are being offered and when they meet. Work out a rough schedule and a couple alternative courses and bring them with you to your appointment. Be sure that you have completed all prerequisites before attempting a particular course.

Your advisor should have your green-colored advising folder. You will also need an Engineering Course Selection form which you may obtain at 2150 Learned Hall or on-line at <https://ceae.ku.edu/sites/ceae.ku.edu/files/docs/AdvisingForm.pdf>. The Course Selection form must be finalized during the advising meeting. After both you and your advisor have signed and dated the form, ask Ms. Solwa in 2148 Learned Hall to make a photocopy of it for you for enrolling on-line. She will retain the original form and will release your advising-hold soon thereafter. Your advisor will retain your folder.

Try not to miss your advising appointment, but if you must, sign up for another time slot during that

advising period. Do not wait until the last minute for advising because you may not complete the required steps, including release of any holds before your on-line enrollment time. If you need to see your advisor to modify your enrollment after the advising period, or for other reasons, check his or her door for established office hours, or phone or E-mail him or her to make an appointment.

To speed your graduation, and/or to lighten your fall/spring course loads, give serious consideration to completing a summer session or two at KU. Chemistry, Physics, English, many electives, and lower-level engineering courses such as thermodynamics, fluid mechanics, statics and dynamics, and strength of materials are usually offered during the summer sessions. Architecture (ARCH) may also offer summer courses.

English Requirements

BS ARCE students are required to complete six credit-hours of English, and for most students this will be through completion of ENGL 101 and ENGL 102. If you have advanced placement into ENGL 102 or 105 you will still need to complete another three credit-hour English course. Any course that has ENGL 102 as a prerequisite is acceptable. ENGL 362 (Foundations of Technical Writing) is a highly-recommended second English course.

All students, including international students, must complete at least one required English course each semester until their English sequence is fulfilled.

Mathematics Requirements

The BS ARCE mathematics requirements are successful completion of MATH 125, MATH 126, MATH 127, MATH 220, MATH 290, and MATH 526. These requirements apply to new as well as transfer students. Those students not yet eligible for MATH 125 need to be placed in the appropriate prerequisite courses, e.g., MATH 104, by the KU Mathematics Department (405 Snow Hall). If eligible, students are encouraged to take the Honors Program versions of the required MATH courses. For example, Honors MATH 145, 146, and 147 may replace MATH 125, 126, and 127. Verify the appropriate Honors courses with your advisor and the Honors Program (www.honors.ku.edu) in advance.

Physics and Chemistry Requirements

The ARCE Program's physics and chemistry requirements are completion of calculus-based physics (8 credit-hours) and chemistry (5 credit-hours). This is fulfilled through PHSX 210, PHSX 212, PHSX 216, PHSX 236 and CHEM 130 or CHEM 150. Transfer students who have at least four credit-hours in PHSX 114 need to complete PHSX 201, for one credit-hour, to then proceed to PHSX 212 and PHSX 236. However, such students should decide in their first couple days of classes whether it is to their advantage to complete the full PHSX 210 and PHSX 216 courses before proceeding to PHSX 212 and PHSX 236.

KU Core Electives

The BS ARCE curriculum satisfies the Core requirements established by KU. Information about the KU Core and Core approved courses can be found at kucore.ku.edu. The KU Core comprises three general education (GE) goals and three advanced education (AE) goals, with a corresponding set of learning outcomes associated with each of the six goals. To satisfy the requirements of the KU Core a student must complete a total of 12 units. A KU Core unit is defined as an approved course, an approved educational experience, or an approved combination of course work and experiences.

Of the total 12 units required by the KU Core, nine are satisfied by required courses in the BS ARCE curriculum. These nine courses (and their outcome codes) are PHSX 210 General Physics I (GE1.1), MATH

125 Calculus I (GE1.2), ENGL 101 Composition (GE2.1), ENGL 102 Critical Reading and Writing (GE2.1), oral communications elective (GE2.2), CHEM 130 or 150 Chemistry (GE3N), ARCH 540 Global History of Architecture I (GE3H), ARCH 541 Global History of Architecture II (AE4.2), and CE 562 Design of Steel Structures (AE6.1).

The remaining three units of the KU Core in the BS ARCE curriculum are completed through elective courses in Social Sciences (GE3S), Human Diversity (AE4.1), and Ethics and Social Responsibility (AE5.1). While students are allowed to pursue approved educational experiences to satisfy the requirements of the KU Core curriculum, educational experiences will not fulfill the architectural engineering curriculum requirements for those courses.

Architectural Studio and Workshop Requirements

You will complete two architectural studios and one design workshop as part of your BS ARCE degree program. If you will continue your studies toward an NAAB-accredited Master of Architecture (M.ARCH) degree at KU, you should likely complete more design studio courses. Consult with an architecture advisor in Marvin Hall on studio placement. If pursuing the M.ARCH consider attending summer sessions to complete other courses so that you can take more design studios in the fall and/or spring semesters. Also check to see if an appropriate studio course is offered in the summer session. If you have a light course load in your last undergraduate semester, and you have been admitted to the Master of Science in ARCE or the Master of Architecture or any other graduate program at KU, you may be able to reserve up to six credit-hours of extra coursework toward your graduate degree. If you intend to take courses for graduate credit during your last semester you must apply in advance for admission to the Graduate School (www.graduate.ku.edu).

Computer-Assisted Drafting Course

ARCE 217 is the required introductory drafting course. The course covers 2D drafting and 3D modeling using AutoCAD and building information modeling (BIM), including architectural, structural, mechanical, electrical, and plumbing design in Revit using family elements.

ARCHITECTURAL ENGINEERING

KU CORE DISTRIBUTION



CRITICAL THINKING & QUANTITATIVE LITERACY

GE 1.1 CRITICAL THINKING: PHSX 210
GE 1.2 QUANTITATIVE LITERACY: MATH 125



COMMUNICATION

GE 2.1 WRITTEN COMMUNICATION:
ENGL 101 and ENGL 102
GE 2.2 ORAL COMMUNICATION:
COMS 130, 132 or via Oral Communications Elective



BREADTH OF KNOWLEDGE

GE 3H ARTS & HUMANITIES: ARCH 540
GE 3N NATURAL SCIENCES: CHEM 130 or 150
GE 3S SOCIAL SCIENCES:
MEET VIA KU CORE REQUIREMENTS



CULTURE & DIVERSITY

AE 4.1 DIVERSITY IN UNITED STATES:
MEET VIA KU CORE COURSES
AE 4.2 GLOBAL AWARENESS:
ARCH 541



SOCIAL RESPONSIBILITY & ETHICS

AE 5.1 ETHICS & SOCIAL RESPONSIBILITY:
MEET VIA KU CORE REQUIREMENTS



INTEGRATION & CREATIVITY

AE 6.1 INTEGRATION & CREATIVITY:
CE 562

ARCHITECTURAL ENGINEERING SPECIFIC GENERAL EDUCATION REQUIREMENTS: Must complete 6 hours of English. Culture & Diversity goals must be met through approved courses. Visit kucore.ku.edu/courses for approved courses and activities.

Engineering Sciences Requirements

Your required engineering science (ES) courses are ARCE 217, ARCE 350, CMGT 457, ARCE 660, CE 301 (or CE/ME 201 + CE 300), CE 310, CE 461, EECS 315, ME 312, and CE 330 (or ME 510). You also have the option of taking a three credit-hour engineering science or engineering design elective; suggested electives for your area of emphasis appear in the BS ARCE *Electives List* on our website. It is to your advantage to have all your engineering science courses completed before you attempt the FE Exam, taken typically by ARCEs in their last semester.

If CE 301 (Statics and Dynamics) does not fit in your schedule, you may substitute CE or ME 201 (Statics) and CE 300 (Dynamics). It is important to complete Statics early because it is a prerequisite for CE 310, Strength of Materials. CE 330 (Fluid Mechanics) has Dynamics as a prerequisite; ME 510 (Fluid Mechanics) requires ME 312 (Thermodynamics).

Engineering Design Requirements

Your required engineering design (ED) courses are ARCE 101, CMGT 500, CE 562, CE 563, ARCE 640, ARCE 650, ARCE 661, and ARCE 698. In taking your engineering science and design courses, be aware that you will need to apply the knowledge you gain in these courses to realistic design problems in ARCE 698; also, retain your ES and ED course materials because you will need them for ARCE 698.

The current curriculum for the KU Bachelor of Science in Architectural Engineering is shown in the following page.



**BACHELOR OF SCIENCE IN ARCHITECTURAL ENGINEERING (BS
ARCE) THE UNIVERSITY OF KANSAS (KU)**
For Fall 2019 and Later Matriculations

Fall Semesters		<u>FIRST YEAR</u>		Spring Semesters	
ARCE 101	Intro. to Architectural Engineering	2	ARCE 217	Computer-Assisted Building Design	3
ARCH 100 ^F	Architectural Foundations I	4	ARCH 101 ^S	Architectural Foundations II	4
ENGL 101 ^H	Composition (<i>KU Core: GE21</i>)	3	ENGL 102 ^H	Critical Reading and Writing (<i>GE21</i>)	3
MATH 125 ^H	Calculus I (<i>GE12</i>)	4	MATH 126 ^H	Calculus II	4
Elective ^H	Oral Communications (<i>GE22</i>) ¹	<u>3</u>	PHSX 210 ^H	Gen. Physics I for Engineers (<i>GE11</i>)	3
			PHSX 216 ^H	General Physics I Laboratory	<u>1</u>
		16			18
		<u>SECOND YEAR</u>			
CE 301	Statics and Dynamics	5	ARCE 350 ^{S,H}	Building Materials Science	3
CHEM 150 ^H	Chemistry for Engineers I (<i>GE3N</i>)	5	CE 310 ^H	Strength of Materials	4
MATH 127 ^H	Calculus III	4	ME 312	Basic Engineering Thermodynamics	3
PHSX 212 ^H	General Physics II	3	MATH 220 ^H	Applied Differential Equations	3
PHSX 236 ^H	General Physics II Laboratory	<u>1</u>	MATH 290 ^H	Elementary Linear Algebra	2
			Elective ^H	Social Science (<i>GE3S</i>) ¹	<u>3</u>
		18			18
		<u>THIRD YEAR</u>			
ARCH 540 ^F	Global History of Arch. I (<i>GE3H</i>)	3	ARCH 541 ^S	Global History of Arch. II (<i>AE42</i>)	3
ARCH 626 ^F	Bldg. Tech. I: Const. Sys. & Asmbl.	3	ARCE 315 ^S	Electric Circuits & Machines	3
ARCE 660 ^{F,H}	Building Thermal Science	3	ARCE 650 ^S	Illumination Engineering	3
CE 330 ^F /ME 510	Fluid Mechanics	3	ARCE 661 ^S	HVAC&R Systems Design	3
MATH 526	Applied Mathematical Statistics I	<u>3</u>	CE 461	Structural Analysis	<u>4</u>
		15			16
		<u>FOURTH YEAR</u>			
ARCE 640 ^F	Power Systems Engineering I	3	ARCE 698 ^S	Comprehensive Design Project	3
CE 562	Design of Steel Structures (<i>AE61</i>)	3	CE 562	Design of Steel Structures (<i>AE61</i>)	3
or		3	or		3
CE 563	Design of Reinfrcd. Concrete Structr.	3	CE 563	Design of Reinfrcd. Concrete Structr.	3
CE 610	Engineering Ethics (<i>AE51</i>) ³	3	CMGT 500 ^S	Construction Engineering	3
CMGT 457 ^F	Construction Project Management	3	Elective ^H	Human Diversity (<i>AE41</i>) ¹	3
Elective ²	Engr. Science or Engr. Design	<u>3</u>	Required ⁴	Fundamentals of Engineering Exam	<u>0</u>
		15			12

TOTAL CREDIT-HOURS = 128

¹ See the lists of acceptable General Education (GE) and Advanced Education (AE) *KU Core* courses at kucore.ku.edu.

² See the BS ARCE's *Electives List* at www.ceae.ku.edu/degree-requirements-arce-bs. ³ Other AE51 courses are also allowed. See footnote (1) above for more information. ⁴ Taking the Fundamentals of Engineering (FE) Exam is a requirement of this program for graduation. ^(F) Courses are only offered in the Fall Semesters. ^(S) Courses are only offered in the Spring Semesters. ^(H) Honors options available. Consult with your CEAE and University Honors Program advisors for details.

OTHER TOPICS OF INTEREST

Course Load

Full-time status at KU during a fall or spring semester usually requires enrollment in 12 credit-hours or more for undergraduates. But to complete your degree in eight semesters, you must successfully complete an average of 16 credit-hours per semester. If you will be employed or have other significant time commitments, you will likely need to reduce your course load. A general guideline is that three times your course credit-hours plus your employment hours per week should be less than or equal to 60.

Many courses are offered in the summer at KU and can help you to graduate earlier or to lighten your fall/spring enrollments. A full-time summer course load is about eight credit-hours.

Course Grading

In accordance with the University Senate Regulations, the letter grades A, B, C, D, F, and I are used for final grades in ARCE, CE and CMGT courses. Pluses and minuses (+/-) are assigned in some of our courses as they are for Architecture (ARCH) courses. Letter grades are defined by the University as:

- A** For work of marked excellence, indicating high honor.
- B** For work much more than average quality.
- C** For work of average quality.
- D** For work of the lowest quality that would enable the student to pursue, without undue lack of material or method, the next dependent course, whether this latter course be in the same department or in a related department.
- F** For work not of sufficiently high quality to merit credit for the course.
- I** Indicates that the student did not complete the work in that course by the designated date.

Architectural Engineering students are not required to retake a course in which they receive a D unless a higher grade is a prerequisite for another required course. But both your overall and engineering GPAs must be 2.0 or higher to graduate; KU ARCEs strive for the highest GPAs possible to demonstrate their abilities and to preserve the most options for possible graduate study.

Adding and Dropping Courses

To add or drop courses after the initial open on-line add/drop period, get the appropriate forms from the Engineering Undergraduate Programs Office in 1415 LEEP2 or from Ms. Reta Solwa in 2148 Learned Hall and complete the forms in ink. If required, obtain your advisor's signature and an engineering Dean's stamp, then proceed to Strong Hall's Enrollment Center.

The various professional Schools (Engineering, Architecture & Design, Business, etc.) and the College of Liberal Arts and Sciences generally define three "drop periods" in each semester. Each of these drop periods usually has different requirements and restrictions. For a specific course, the rules of the division offering that course may apply, e.g., the deadlines and other restrictions may vary.

ARCE, CE, and CMGT courses are governed by the drop policy of the School of Engineering, and not the School of Architecture & Design. The KU *Undergraduate Catalog* and the School of Engineering's *Undergraduate Student Handbook*, available on-line, have more detailed information about dropping courses, as well as the retake policy.

Academic Misconduct

ARCE students and faculty are subject to the academic misconduct policies found on KU's and the School of Engineering's websites. Some examples of academic misconduct by students include copying on exams or homework that are to be completed individually, improper reuse of previous work (plagiarism of written materials, software, or drawings), forging signatures, or altering enrollment forms or other records. If you find yourself in a questionable situation ask your instructor and/or advisor for guidance. Engineering ethics require that you report to the proper authority known incidents of academic misconduct either by students or faculty. Dealing with such problems early, tactfully, and with reasonable privacy is often the best approach to resolving them.

Study Abroad

Students are encouraged to take advantage of the study abroad opportunities offered by the various schools and the University. Many ARCE students have studied abroad for up to a year; the summer-studio in Italy offered by the Architecture Program has been popular. "Building Services Engineering" programs at European and Australian universities are somewhat comparable to our mechanical/energy and lighting/electrical emphases in ARCE. Study of structures is usually part of civil engineering programs in Europe. Because of differences in course offerings, semesters' timing, etc., you need to fully investigate your study-abroad program to ensure timely graduation from KU. You should start planning for study abroad at least one year in advance, and you need to be fluent in the language of instruction; the KU Study Abroad office, via Lippincott Hall or www.studyabroad.ku.edu, can assist you with your planning.

Honors Program

Qualified students are encouraged to participate in KU's Honors Program. Obtaining enough Honors' credit-hours requires careful planning. More information can be found in the KU *Undergraduate Catalog* and via the Honors Program's website, www.honors.ku.edu, or at their office in the Nunemaker Center, 1506 Engel Road.

Edwards Campus Courses

Some higher-level electives and other courses have been offered at the Edwards Campus of KU in Overland Park, KS, typically in the evenings. But, again, 800-level and higher courses normally cannot count toward an undergraduate degree at KU. If you enroll in a course at the Edwards Campus you will need reliable transportation. Also, the tuition and course fees are significantly different for the Edwards Campus than for the Lawrence Campus, so plan accordingly.

Engineering Fees

A special "differential tuition" fee is collected per credit-hour for all engineering courses. These funds are pooled and used to acquire instructional equipment, software, supplies, and services, e.g., the computers, printers, and plotter in the ARCE Senior Design Laboratory, 3101 Learned Hall. If you have an idea for an appropriate use of these collected fees, please forward a short note or E-mail to your ARCE advisor describing your suggestion.

Reciprocity

Eligible residents of Missouri in our BS ARCE program should apply each semester for tuition reduction through the Kansas-Missouri reciprocity agreement. This agreement allows a varying number of

Kansas residents to study dentistry in Missouri at in-state tuition rates, and Missouri residents to study architecture or architectural engineering in Kansas. You can obtain the necessary tuition-reduction request form from the School of Engineering's Student Success Office, 1415 LEEP2.

Computers

Most of the ARCE faculty and students use MS Windows-based personal computers and software. While many microcomputers are provided at various locations in the Department, the School of Engineering, the School of Architecture & Design, and the University, many students purchase their own. If you are considering acquiring a new personal computer, first determine what hardware and software you will need for your coursework. An "office suite" of software may be sufficient for at least your first semester or two and may be obtained through the KU IT department at a significantly reduced cost (<https://technology.ku.edu/software/>); acquiring a CAD or BIM license in advance is not recommended as they tend to be expensive and the versions change rapidly. AutoCAD® and Revit® are installed on PCs in many of the ARCE, CEAE, SoE, and SA&D computer labs.

E-mail and SoE Computing

As soon as possible sign up for a free KU E-mail account on-line via <http://technology.ku.edu/personal-accounts/>. Choose a logical username (e.g. Bob P. Smith would probably use "bpsmith") and a desired initial password. Your final E-mail address will then be something like "bpsmith@ku.edu." Avoid using a nickname or expression for your KU username as some E-mail recipients, potential employers for example, may consider your messages to be unidentifiable spam or unprofessional-sounding.

There are many computers on campus where you can access your E-mail using a web browser or a freestanding E-mail client program. You should be able to logon to the hardwired desktop ARCE, CEAE, and SoE computers using "HOME" and your KU username (e.g., "bpsmith") and password. Most of the engineering complex has WiFi service. Visit the School of Engineering Technology Service Center (Engineering TSC) website, via www.engr.ku.edu/technology-service-center, for more information and to submit any help requests.

World-Wide Web Home Pages

The Department has a website at www.ceae.ku.edu. The Department's webpages are only for distributing lasting information about our programs and student organizations -- links are not provided to personal home pages. If your student group's home page needs updating, contact the organization's President or faculty advisor to volunteer.

Student Organizations

You are encouraged to participate in the various student organizations associated with the Program, the Department, the two Schools, and the University. However, be careful not to over-commit yourself -- your undergraduate studies should command most of your time and energy.

The Architectural Engineering Institute (AEI) is the umbrella organization for ARCEs. Specialty organizations are the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), Associated General Contractors of America (AGC), Emerging Green Builders (EGB), the National Electrical Contractors Association (NECA), and the Illuminating Engineering Society of North America (IESNA). Phi Alpha Epsilon (ΦAE) is the national, discipline-specific architectural engineering

honor society, and Tau Beta Pi (TBPi) is the national and school-wide engineering honor organization. Membership in one or more of these organizations as a student is usually low in cost, can help you build contacts in your field (“to network”), and can enhance your resume and student experience at KU.

Personal Library

You should retain all your textbooks, references, electronic media, handouts, and class notes to build a personal library. You should also regularly add to and update your library. By doing this you will significantly reduce the time you spend visiting libraries or searching the web to secure information. Through being a student member of various professional organizations you can usually obtain many otherwise expensive publications at substantial discounts. For example, the four volumes of the *ASHRAE Handbook*, in print or electronic format, are available to student members at about a 70% discount.

Summer Employment

A student who completes his or her BS ARCE in four years will have three summers when valuable work experience can be gained. The ARCE faculty recommends that you seek summer positions that will give you “real-world” construction, engineering design, and research experience. Working on job sites as a construction helper for your first summer or two will expose you to many design, construction, code, and safety issues. Working another summer as a CAD/BIM operator will hone your computer skills. Your last summer or two as an undergraduate should be spent as a design intern in a consulting engineering firm, as a construction management intern, and/or as an undergraduate research assistant (UGRA). Internships allow you to gain actual work experience but also give an employer a chance to evaluate you before committing to hire you permanently. A research assistantship introduces you to topics that may be pursued in graduate studies; ask the department’s Associate Chair for Graduate Programs, Prof. Dennis Lane in 2150 Learned Hall, for information about research projects that may need UGRAs, and about our graduate degree programs.

Employment Placement Services

The School of Engineering offers valuable placement assistance through its Engineering Career Center (ECC) in 1410 LEEP2. Many manufacturing and engineering companies offer on-campus interviews through the ECC, but ARCE students often seek summer and permanent positions directly from employers too. You are encouraged to use the Center and to participate in its Career Fairs, but your ARCE 698 instructor and/or academic advisor can likely help put you in direct contact with potential employers. You should begin your permanent employment and/or graduate program search around the beginning of your last year of study; do not wait until your last semester. Start your job search by developing a highly-refined resume, registering with the ECC, and networking via your professional society.

Professional Engineering Registration

You are encouraged to pursue registration as a Professional Engineer (P.E.). As of this writing, registration in the State of Kansas requires at least:

- A. an ABET-accredited Bachelor of Science in engineering degree
- B. passage of the Fundamentals of Engineering Exam (the “FE” exam)
- C. four years of engineering experience under the direct supervision of a registered Professional Engineer, and
- D. passage of the Principles and Practices Exam (the “PE” exam).

Your Bachelor of Science in Architectural Engineering degree is ABET-accredited. *You are strongly encouraged to take the FE exam immediately after completing your engineering sciences and other exam-covered topics; **taking the FE exam is a requirement of the Department for graduation.*** Students must provide documentation showing that they took the exam to Ms. Reta Solwa.

To register for the FE exam visit www.ncees.org. The computer-based FE exam is administered year-round in established testing windows at NCEES-approved Pearson VUE test centers. The exam is administered during a 6 hour-long appointment, with a scheduled 25-minute break. Specifications for the seven disciplines of the FE exam may be found at <http://ncees.org/exams/fe-exam/>. It is recommended that ARCEs select the “FE Other Disciplines” of the exam.

You should seek permanent employment in firms where you will work on engineering projects with increasing personal responsibility. You must work under the *direct* supervision of a P.E. to fulfill the experience requirement. Additionally, you will need letters of recommendation from at least two other Professional Engineers. Be sure to keep these others informed of your engineering activities during your four-year internship.

To help prepare for the mechanical, electrical, or civil/structural P.E. exam you should take as many engineering courses as possible in one of these emphases. Even after graduation you may want to complete extra courses to improve your performance on a P.E. exam. Some relevant CE, ME, EECS, and other courses are offered at KU's Edwards Campus in Overland Park, as well as in Lawrence.

You can obtain information on current Kansas registration requirements, procedures, and examinations from the Kansas State Board of Technical Professions via their website at www.ksbtp.ks.gov, by mail at 900 SW Jackson Street, Suite 507, Topeka, Kansas 66612-1257, or by calling (785) 296-3053.

Graduate Study in Engineering

Your undergraduate education in architectural engineering should prepare you for a productive entry-level position and career. However many students desire and seek a higher level of formal education, and some engineering positions, especially in structural engineering, *require* advanced degrees. Earning KU's Master of Science in Architectural Engineering (MS ARCE), either directly after your bachelor's degree or after working for some time, will allow you to study in depth an area of specialization. The MS ARCE program is also open to graduates of other engineering disciplines who wish to pursue careers related to buildings. Our Master of Construction Management (MCM) is offered too on the Lawrence Campus, however it is not an engineering degree – be sure to consider the MS ARCE with a construction emphasis if earning a graduate engineering degree is desired.

If you are interested in a potential career in engineering teaching and/or research, then you should earn both a Master of Science (with thesis) and a Doctor of Philosophy (Ph.D.) in engineering. Obtaining such degrees is a challenging and intellectually rewarding experience. If you seek both degrees, you should plan for at least five years of full-time, rigorous study past your bachelor's degree. To enhance your probabilities for admittance to and success in an engineering Ph.D. program, you should show excellence in completing advanced theoretical and numerical engineering courses in your Master's program.

The Architectural Engineering Program's Master of Science in Architectural Engineering degree requires 30 credit-hours. There are thesis, report, and design options. Areas of study include mechanical and energy systems, lighting and electrical systems, construction management, structures, and hybrid or emerging topics such as sustainability or fire protection. Through advanced ARCE and other courses you and your advisor will assemble a graduate plan-of-study that will help you achieve your educational and professional goals. Even if you obtained your undergraduate degree at KU, you will still find many challenges awaiting

you in our Master of Science program. You can learn more about our MS ARCE by visiting - www.ceae.ku.edu, and by visiting with the CEAE Graduate Advisor and ARCE professors. If you are interested in graduate study in the area of structures, investigate KU's Master of Science in Civil Engineering program too. The “professional” (NAAB-accredited) Master of Architecture is available as well through the SA&D. Many graduate-level ARCH, and Engineering Management (EMGT) courses are offered at the Edwards Campus in Overland Park. Applications for graduate engineering admission are completed and submitted on-line via www.engr.ku.edu/prospective/graduate/apply/.

Architectural engineering does not offer a Ph.D. degree, but civil engineering does and ARCE professors can chair or serve on Ph.D. in CE committees. Profs. Rock and Medina can chair or serve on mechanical engineering Ph.D. committees; all ARCE faculty can likely serve on Ph.D. in architecture committees too. If you are considering earning a graduate degree, discuss it as early as possible with your advisor and the faculty members in your area of interest. More information on CEAE graduate degree programs can be obtained from www.ceae.ku.edu and the CEAE Associate Chair for Graduate Programs, Prof. Dennis Lane, in 2150 Learned Hall.

