

**ARCHITECTURAL ENGINEERING  
UNDERGRADUATE GUIDE**

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



**THE UNIVERSITY OF KANSAS**

**CEAE DEPARTMENT**

***Revised  
October 2015***

*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***

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Updated versions of this document may be available from the  
Department office or on our website via [www.ceae.ku.edu](http://www.ceae.ku.edu).

## **KU ARCHITECTURAL ENGINEERING PROGRAM** ***UNDERGRADUATE GUIDE***<sup>1</sup>

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 to become a successful member of our community and to complete your degree requirements efficiently. Please read this document as soon as possible and review it before each meeting with your ARCE academic advisor.

After you are settled into your living arrangements you should locate and visit Learned, Eaton, LEEP2, and Marvin Halls. Learned, Eaton, and LEEP2 Halls are on the northwest corner of 15th Street and Naismith Drive, while Marvin Hall, home of the architecture program, is on Jayhawk Boulevard. The ARCE Program's faculty members have their offices in or near 2134 and 2150 Learned Hall; the KU Visitor Center ([www.ku.edu/visit](http://www.ku.edu/visit)) can help you find us. When on campus introduce yourself to Ms. Reta Solwa, Senior Administrative Associate, in Room 2150 of Learned Hall, the main office of our CEAE Department. If you were not advised at a new student orientation session, get the name of the faculty member who is your academic advisor from Ms. Solwa. The ARCE program faculty members, of the CEAE Department, are:

**Hongyi Cai, Ph.D.** Assistant Professor. Lighting, daylighting, and human factors.  
(2134-C Learned Hall; [hyc@ku.edu](mailto:hyc@ku.edu))

**Brian Lines, Ph.D.** Assistant Professor. Construction engineering and management.  
(2135-B Learned Hall).

**Robert H. Lyon, P.E.** Professor of Practice. Structural analysis and design.  
(2134-E Learned Hall; [blyon@ku.edu](mailto:blyon@ku.edu))

**Mario A. Medina, Ph.D., P.E.** Associate Chair and Associate Professor. Building thermal and materials sciences, building energy, and energy management.  
(2150-D Learned Hall; [mmedina@ku.edu](mailto:mmedina@ku.edu))

**Michael Panethiere, P.E.** Professor of Practice. Building electrical and power systems.  
(2135-A Learned Hall; [mpanethiere@ku.edu](mailto:mpanethiere@ku.edu))

**Brian A. Rock, Ph.D., P.E., F. ASHRAE** Associate Professor. Building mechanical systems, indoor air quality, solar, fire protection.  
(2134-D Learned Hall; [docrock@ku.edu](mailto:docrock@ku.edu))

**Daniel Tran, Ph.D.** Assistant Professor. Construction engineering and management.  
(2135-C Learned Hall; [Daniel.Tran@ku.edu](mailto:Daniel.Tran@ku.edu))

In addition, faculty members of the structural engineering and other groups in the department also serve as BS ARCE student advisors.

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<sup>1</sup> 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, and Planning.

## **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, Ph.D., P.E.

## **Program Administration**

Admission to the program is handled by the School of Engineering. After being admitted, your progress-to-degree is overseen by the ARCE faculty, the CEAE Department, and the School of Engineering. For example, every semester after you see your advisor in Architectural Engineering you will submit a completed advising form to Ms. Reta Solwa in 2150 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. Michael Branicky, Sc.D., P.E. When visiting the Engineering Dean's Office at 1 Eaton Hall, you will likely interact with the undergraduate student staff, Ms. Amy Lampe (Director of Academic Services), or Prof. Lorin Maletsky, Ph.D. (Associate Dean for Undergraduate Studies).

Day-to-day administrative duties are handled by the faculty and staff of the ARCE program. 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* (via [www.ku.edu/academics/catalogs/](http://www.ku.edu/academics/catalogs/)), the on-line *Schedule of Classes* ([classes.ku.edu](http://classes.ku.edu)), the School of Engineering's *Undergraduate Student Handbook* ([www.engr.ku.edu/undergraduate/](http://www.engr.ku.edu/undergraduate/) or via 1 Eaton Hall), and the Department ([www.ceae.ku.edu](http://www.ceae.ku.edu) or via 2150 Learned Hall).

## Summary of Significant Events Toward Your Bachelor's Degree

- Be admitted to the BS ARCE degree program (start at <http://www.engr.ku.edu/prospective/>)
- 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 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

To obtain your Bachelor of Science in Architectural Engineering (BS ARCE) degree you must complete at least 128 credit-hours of coursework. On our website you can find the current BS ARCE curriculum (<http://www.ceae.ku.edu/plan-study>) and *Electives List* (<http://www.ceae.ku.edu/curriculum-guides>). While you are encouraged to keep on track, studies have shown that less than 10% of students in all programs follow curricula exactly -- for example you may already have some transfer or Advanced Placement credits. You will work closely with your advisor each semester to optimize your course selections.

You are required to complete the courses listed in the version of the curriculum under which you were admitted or readmitted. However, 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. The ARCE 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!* Also regularly empty your e-mail in-box and trash folders to prevent bounce-backs of important messages. *You can update your contact information at 121 Strong Hall or on-line via <http://www.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 outside 2150 Learned Hall, 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 area of interest. Request a change of advisor via Ms. Reta Solwa. During advising periods each advisor will have sign-up sheets posted on his or her office door. 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](http://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. The Course Selection form must be completed during the advising meeting. After both you and your advisor have signed and dated the form, ask Ms. Solwa in 2150 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 (found via [students.ku.edu](http://students.ku.edu)). 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.

### **Curriculum**

The current curriculum for the KU Bachelor of Science in Architectural Engineering degree can be found via <http://www.ceae.ku.edu/plan-study>. The BS ARCE *Electives List* is available at <http://www.ceae.ku.edu/curriculum-guides>, also in PDF format.

### **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. For example, 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). It is recommended that one MATH course be taken each semester until all are completed through MATH 526. An exception is that both MATH 220 and 290 can be completed in the same semester.

MATH 115 and 116 are lower-level calculus courses taken by business, architecture, and other students in many academic programs. MATH 125, 126, and 127 are more rigorous calculus courses taken by students majoring in engineering and science, and are thus required in the ARCE curriculum.

The Honors Program versions of the required MATH courses can be completed instead. For example, honors MATH 145 and 146 may replace MATH 125 and 126. Verify the appropriate honors courses with your advisor and the Honors Program ([www.honors.ku.edu](http://www.honors.ku.edu)) in advance.

### **Physics and Chemistry Requirements**

The ARCE Program's physics and chemistry requirements are completion of calculus-based physics (9 credit-hours) and chemistry (5 credit-hours). This is fulfilled through PHSX 211, PHSX 212, PHSX 216, PHSX 236 and CHEM 150. New students must complete PHSX 211, PHSX 216, and PHSX 212, PHSX 236. 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 211 and PHSX 216 courses before proceeding to PHSX 212 and PHSX 236. It is important for you to complete CHEM 150 before taking the Fundamentals of Engineering (FE) exam, and preferably before ME 312 (Thermodynamics) even though chemistry is not a listed prerequisite.

## KU Core Electives

The BS ARCE curriculum found at <http://www.ceae.ku.edu/plan-study> satisfies the Core requirements established by KU. Information about the KU Core and Core approved courses can be found at [kucore.ku.edu](http://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 eight courses (and their outcome codes) are PHSX 211 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 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 Requirements

You will complete a minimum of one and up to two Architectural Studios 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, including study-abroad in Italy, for example. If you have a light course load in your last undergraduate semester, and you have been admitted to the Master of Architecture or any other graduate

## ARCHITECTURAL ENGINEERING KU CORE DISTRIBUTION



### CRITICAL THINKING & QUANTITATIVE LITERACY

GE 1.1 CRITICAL THINKING: PHSX 211  
GE 1.2 QUANTITATIVE LITERACY: MATH 125



### COMMUNICATION

GE 2.1 WRITTEN COMMUNICATION:  
SIX HOURS OF ENGLISH COURSES  
GE 2.2 ORAL COMMUNICATION:  
COMS 130-132



### BREADTH OF KNOWLEDGE

GE 3H ARTS & HUMANITIES: ARCH 540  
GE 3N NATURAL SCIENCES: CHEM 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 ETHICS & SOCIAL RESPONSIBILITY:  
MEET VIA KU CORE REQUIREMENTS



### INTEGRATION & CREATIVITY

AE 6: 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](http://kucore.ku.edu/courses) for approved courses and activities.

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](http://www.graduate.ku.edu)).

### **Drafting Course**

ARCE 217 is the required introductory drafting course. Primarily 2-D CAD skills are needed, but some 3-D work may be needed in ARCE 699 or other courses.

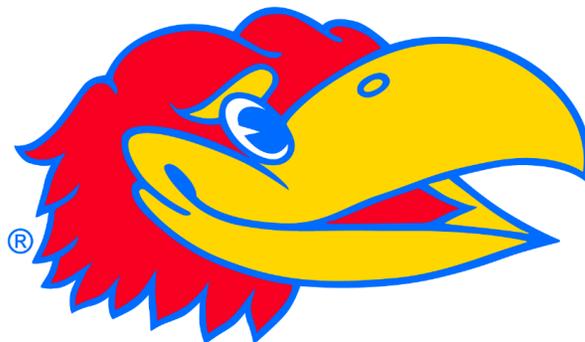
### **Engineering Sciences Requirements**

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 ME 510 (or CE 330). You also have the option of taking a three credit-hour engineering science 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 the second semester of their senior year.

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 699. ARCE 699, ARCE Comprehensive Design Project, has prerequisites of CMGT 500, ARCE 640, 650, and 661, as well as CE 562 and 563. You must also have substantial CAD/BIM and plotting skills, either through coursework (e.g., ARCE 217) or work experience before enrolling in ARCE 699. 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 699; retain your ES and ED course materials because you will need them for ARCE 699. In our capstone course, ARCE 699, all students complete structural, mechanical, illumination, and power systems analyses and designs.



## 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 (known as “the Mulinazzi Rule”).

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.

Special permission is required, in advance, for an undergraduate to take an 800-level or above course; normally 800- or 900-level courses cannot count toward an undergraduate degree at KU. Also, students in their last semester who are entering a graduate program can petition the Graduate School to take up to six extra credit-hours of graduate-level courses and reserve them for graduate credit.

### 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 not assigned in our courses as they are for Architecture (ARCH) and Urban Planning (UBPL) courses. However, when you take a course in a department that uses the +/- system you will be graded in that course using the +/- system. 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.

### Credit/No Credit

No courses that count toward the BS ARCE may be taken as Credit/No Credit (C/NC). One course per semester not counted toward the BS ARCE may be taken as Credit/No Credit. Students taking extra courses toward a minor, a Master of Architecture, or any other degree, should check with that minor- or degree-granting program to determine if they accept Credit/No Credit grading for their required courses.

## **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 in 1415 LEEP2 or Ms. Reta Solwa in 2150 Learned Hall and complete the forms in ink. If required, obtain your advisor's signature during his or her office-hours or via an appointment, and an engineering Dean's stamp, then proceed to Strong Hall's Enrollment Center.

The various professional Schools (Engineering, Architecture, Design, and Planning, 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, and Planning. 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. Due to 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](http://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](http://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 Dean’s Office, 1 Eaton Hall.

### **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 Planning, 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 (<http://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 SADP 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. Later you can create more-interesting aliases via [www.email.ku.edu](http://www.email.ku.edu) for corresponding with your friends, if desired.

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](http://www.engr.ku.edu/technology-service-center), for more information and to submit any help requests.

## **World-Wide Web Home Pages**

You can create and then store a personal home page using your KU account. The Department has a website at [www.ceae.ku.edu](http://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 ( $\Phi$ AE) is the national, discipline-specific architectural engineering honor society, and Tau Beta Pi (TBP) 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 texts, 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. Bruce McEnroe 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 699 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. Amy Lampe (Director of Undergraduate Academic Services) or the School of Engineering.

To register for the FE exam visit [www.ncees.org](http://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](http://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 fruitful 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. An MS can usually be completed in one or two years of full-time study including summers. 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 both thesis and report 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](http://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 SADP. 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/](http://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](http://www.ceae.ku.edu) and the CEAE Associate Chair for Graduate Programs, Prof. Bruce McEnroe, in 2150 Learned Hall.

