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List of Acronyms

ArchE – Architectural Engineering  
AEI – Architectural Engineering Institute  
AME – Aerospace and Mechanical Engineering  
AP - Advanced Placement  
ASCE – American Society of Civil Engineers  
CAB – Capstone Advisory Board  
CEC - Carson Engineering Center  
CSA - Center for Student Advancement  
CEES - Civil Engineering and Environmental Science  
CoE - College of Engineering  
DN – Degree Navigator  
EPF – Engineering Practice Facility  
FE - Fundamentals of Engineering  
LEED Leadership in Energy and Environmental Design  
MPGE - Mewbourne School of Petroleum and Geological Engineering  
OU – University of Oklahoma  
PEOs - Program Educational Objectives  
REU - Research Experience for Undergraduates  
SRF - Salary Release Funds  
SRI - Sponsored Research Incentive  
TA - Teaching Assistant  
TSRC - Technology and Software Review Committee  
UC - University College  
VC – Visiting Council  
WSSC - Williams Student Services Center
BACKGROUND INFORMATION

A. Contact Information

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B. Program History

Architectural Engineering (Arch E) has a long history at the University of Oklahoma (OU). Up until 2004, the program was titled Engineering Pre-Architecture and was administered through the College of Engineering (CoE) Dean’s Office. Prior to the 2005 accreditation visit, the curriculum from the Engineering (Pre-Architecture option) degree program was revamped and titled Architectural Engineering. The Arch E curriculum was submitted to the OU Academic Programs Council and Provost in October of 2004. It was approved in December of 2004. The curriculum was subsequently approved by the OU Regents in January of 2005. The curriculum was then submitted as a new degree program to the State Regents for Higher Education in January of 2005. The proposed program was circulated for review and comment among all of the institutions of higher learning in the state during the spring of 2005. All questions from the State Regents for Higher Education were answered and the Arch E degree program was approved during the June 2005 meeting of the State Regents for Higher Education. The Arch E program is now officially administered by the school of Civil Engineering and Environmental Science (CEES) in the CoE. The revised ArchE program was accredited in 2009 and made retroactive to 2007.

Since the Immediate Revisit in 2009, the ArchE program has:

1) Developed and implemented a content-based assessment plan for quantitatively assessing Criterion 3 “a to k” Student Outcomes in each CEES course;
2) Changed the AME 3363 Design of Thermal Fluid Systems course to AME 4653 Air Condition Systems Design.
3) Incorporated a four-hour course (CEES 3774- Design of Concrete and Steel) to ensure that each ArchE graduate gets exposure to design concepts for both concrete and steel;
4) Increased the number of hours in the Introduction to CEES class to 2 (CEES 1112); and.
5) Changed the ArchE curriculum to include a course on Computer Aided Design (CEES 1213).

C. Options

CEES offers an Accelerated Dual Degree (BS ArchE-MS CE) option for qualified students.
**D. Organizational Structure**

The organizational structure for the ArchE program is shown below.
CEES and its Director fit into the following administrative structure of the College of Engineering.
The Dean of the CoE fits within the Council of Deans, which reports to the Senior Vice President and Provost, as shown below.
Finally, the organizational structure of the senior officers of the University is shown below.
E. Program Delivery Modes

The ArchE classes are delivered by the traditional on-campus lecture/laboratory modes.

F. Program Locations

ArchE students can participate in study abroad programs. They must get their study abroad courses pre-approved for academic credit.

G. Deficiencies, Weaknesses or Concerns from Previous Evaluation(s) and the Actions Taken to Address Them

The ArchE program has undergone numerous changes since the last General Review. Listed below is a chronology of events and changes.

1. General Review – The dates of the last General Review visit were October 30 to November 1, 2005. The May 2006 Statement of Finding identified four Program Deficiencies (Program Educational Objectives, Program Outcomes and Assessment, Professional Component, Program Criteria), one Program Weakness (Student Advising) and one Program Concern (Insufficient Faculty). This resulted in the recommendation of “Show Cause” and a revisit.

2. Show Cause Revisit – The dates of the Show Cause Revisit were October 21-23, 2007. As a result of the changes made and materials provided for the 2007, three of the four Program Deficiencies, the Program Weakness and the Program Concern were all resolved. One aspect of the deficiency related to the Program Criteria was not resolved. Specifically, the requirement that students have proficiency and design capabilities in two of three areas. The ArchE program had demonstrated proficiency and design capabilities in structures, but not in building mechanical and electrical. More specifically, the report indicated that the changes implemented did “address building mechanical systems, [but] the courses do not appear to cover building electrical systems.” The deficiency remained unresolved and the EAC Committee recommended “Not to accredit.” CEES filed a request for an Immediate Revisit.

3. Immediate Revisit – The dates of the Immediate Revisit were February 1-3, 2009. Once again, the review committee concluded that there was not sufficient coverage of the design of building electrical systems and the deficiency remained unresolved.

4. 30-Day Response – On April 2, CEES provided a 30 day response document which showed curriculum changes and instructor training that would allow for sufficient coverage of design of building electrical systems.

5. In the summer of 2009, the EAC of ABET met and decided to “Accredit to September 30, 2012.” The accreditation was made retroactive to October 2007.
The 30 Day Response to ABET will be available for review during the campus visit unless requested otherwise.
CRITERION 1. STUDENTS

A. Student Admissions

The University of Oklahoma (OU) College of Engineering (CoE) has historically utilized the same admissions policies for incoming freshmen as that of the institution. The admission of entering engineering freshmen is no more restrictive than those for admission to the university itself. Once admitted, all incoming freshmen at OU, regardless of major, are advised in University College (UC) until they have completed at least 24 credit hours (including Advanced Placement (AP) credit), one full-time semester in residence, and meet the minimum GPA requirements of the college of their declared major. Consistent with the institution, the College of Engineering requires a minimum 2.0 combined retention GPA for acceptance into all but the accelerated (BS/MS), degree programs. Provided students meet this minimum, their records are automatically transferred to the CoE, Williams Student Services Center (WSSC*). However, an engineering student in UC who has completed more than 24 hours and achieved the minimum GPA, yet has unsuccessful attempts in required courses for the curriculum may be denied automatic transfer. This determination is made by the CoE, WSSC director of advising in consultation with the engineering program director.

*The WSSC provides curriculum advising and guidance, degree certification, degree audits, graduation checks, pre-requisite checking, academic performance monitoring as well as recruiting and outreach, tutoring, mentoring, student organization and leadership development, multicultural and diversity programs, and college-level scholarship processing.

1) Freshmen
The admission of entering engineering freshmen is as follows:
Resident freshmen-
- 3.0 high school GPA and top 25% of graduating class
- or-
- 24 ACT/1090 SAT and a 3.0 high school GPA or top 50% of graduating class
Non-resident freshmen-
- 3.5 high school GPA and top 25% of graduating class
- or-
- 26 ACT/SAT 1170 and a 3.0 high school GPA or top 50% of graduating class
(For more information, see: University of Oklahoma, Office of Admissions home page: Undergraduate Admissions/ Freshmen: http://www.ou.edu/content/admissions/home/requirements/undergraduate/freshman_admission.html )

B. Evaluating Student Performance

The evaluation of engineering student performance is assessed and monitored at the university level regarding entry-level assessment, probation and suspension. The director of advising in CoE, WSSC oversees the pre-requisite checking process, and college-level academic performance review. CoE faculty assess student performance in engineering courses by issuing a letter grade. Each of these processes is summarized below:
Entry-Level Assessment – OU’s Assessment and Learning Center provides testing in concert with the state-mandated assessment of higher education. This mandate requires that all incoming freshmen (and some new transfer students), be assessed in the areas of reading comprehension, English and mathematics to ensure appropriate placement into courses. Academic advising professionals assess a student’s preparedness by virtue of:

- ACT/SAT scores
- Completed coursework and GPA’s

Based upon these assessments, students may be required to:

- Complete developmental classes prior to beginning program specific courses
- Undergo subsequent assessments to monitor improvement

(For more information, see OU General Catalog/University College/Entry-Level Assessment: [http://catalog.ou.edu/current/index.html](http://catalog.ou.edu/current/index.html))

Pre-Requisites - The university’s web based enrollment system within the university’s student information system (oZone), includes a pre-requisite check feature which prevents students from enrolling into courses for which they lack the necessary preparation. In the CoE, students are required to earn a minimum grade of “C” in all pre-requisite coursework.

The oZone system permits students to pre-enroll into a course for an upcoming semester if they are currently enrolled in the pre-requisite course. For this reason, a report is generated at the close of any semester or term listing students enrolled in any upcoming courses for which they failed the pre-requisite. The CoE, WSSC director of advising oversees the following process:

1. Obtains a list from the OU Office of Enrollment Services of all CoE students who are enrolled in a course for which they do not possess the minimum qualifications.
2. Sends by email to the chair person of each CoE school a list of the students who will be dropped from an enrolled engineering course.
3. Emails students notification (with read receipt) of the course drop and directs students to meet with a WSSC academic advising professional to revise their class schedules for the upcoming semester.

Any exceptions to students remaining enrolled in a course without the necessary pre-requisites must come from the instructor of the course and chair of the engineering program in which the student is enrolled. Such exceptions are noted in the student’s Degree Navigator (DN) record.

Grading - OU utilizes a 4.0 or A=4, B=3, C=2, D=1, F=0 system. The CoE requires:

1. A minimum grade of C is required for any course applied toward degree completion.
2. Pass/No Pass (P/NP) coursework will not apply toward degree completion.
3. Satisfactory (S) graded credits that result from Advanced Placement (AP), Departmental, College Level Examination (CLEP), and International Baccalaureate (IB), toward program requirements and degree completion.

The institution makes available to students and faculty, the Desire 2 Learn (D2L) system for entering and tracking grades and progress. Ultimately, faculty submit grades via the institution’s oZone system both at the end of the sixth week of classes (Early Progress Report which is not mandated by the institution, but strongly encouraged as an additional retention mechanism), and
no later than the Call for Grades which is typically two days following the end of Finals Week. These grade files download directly to the Office of Academic Records. Students are notified electronically when their final grades are available to be viewed. (For more information, see OU General Catalog/Office of Academic Records: http://catalog.ou.edu/current/index.html)

**College-Level Contract and Stop Out** - The CoE, WSSC director of advising monitors the overall progress of engineering students. CoE students must:

1. Maintain at least a minimum 2.0 retention GPA in their Combined (all coursework, OU and transfer), OU, and Major coursework.
2. Earn a minimum grade of C for any course required for degree completion.

If, at the close of any semester, any of these GPAs fall below the 2.0 minimum, or the student has two failed attempts in a required course for the curriculum, the student is placed on Academic Performance Contract. If the student’s semester GPA is below a 2.0 in the subsequent term, or if after three attempts a student fails to earn a minimum grade of C in a required course, he/she is stopped or dismissed from the college. Exceptions to this rule can be made by the chairperson or director of the student’s program, or the associate dean. (Note: Regarding the three attempts rule, if the student’s first attempt is a W, it does not count against the student.) The college-level stop out process generally precedes and prevents a university-level suspension.

When a CoE student is placed on contract, the CoE, WSSC the Director of Advising:

1. Notifies students by email of their status. (Note: A read receipt is attached to the message to ensure students have received the information. If no read receipt is returned, the student is contacted by phone.)
2. Makes notation of status in student’s DN record.
3. Requests a College Academic Hold be placed on the student’s record to prevent enrollment into any future semesters, terms or sessions

The College Academic Hold will be removed if and when the student meets with an academic advising professional in WSSC to sign an Academic Performance Contract, or the student’s performance improves. In brief, Academic Contracts require students to meet frequently with an academic advising professional throughout the semester to monitor progress. The academic advising professional may require that the student undergo further assessment, and attend career counseling and/or tutoring.

If the student’s academic performance does not improve after one semester, the CoE, WSSC director of advising carries out the following process:

1. Notifies student by email of stop out status. A read receipt is attached to the message to ensure student has received the message. If no read receipt is returned, the student is contacted by phone.
2. Makes notation of stop out status in student’s DN record.
3. Requests a College Academic Stop, and a Center for Student Advancement Stop be placed on the student’s record, which prevents further enrollment in engineering courses.
4. Student is canceled from all enrolled courses.
5. Student referred to the university’s Center for Student Advancement (CSA)

Academic advising professionals in the CSA office guide students toward alternate programs and career options outside of the CoE, or the institution as a whole, whichever is most appropriate.

A student who has been stopped out from the CoE may petition for readmission after demonstrated improvement, which includes completing and at least two full semesters with a 3.0 GPA outside of college. Readmission requires approval of the chairperson or director of the student’s intended engineering program. A student stopped from CoE is unlikely to be re-admitted.

(For more information see: OU General Catalog/College of Engineering/ Scholastic/Transfer and Special Regulations/Academic Performance: http://catalog.ou.edu/current/index.html)

University-Level Academic Probation/Suspension - At the close of each semester, the OU Office of Academic Records reviews all student records and produces a Retention Roster. The director of Academic Records administers the following process:

1. If a student is not making satisfactory progress (i.e., combined retention GPA falls below 2.0) he/she will be placed on Academic Probation by the university, and notified by the director of Academic Records.
2. If a student fails to earn a semester GPA of 2.0 or higher while on Academic Probation, he/she will be suspended by the university, notified by the director of Academic Records and canceled from all future enrollments.
3. An Academic Stop is placed upon the student’s record.

Note: A suspended student may apply for readmission to the university after a specified amount of time which would also require the approval of the CoE. In such instances, a Referral from the OU Office of Admissions is sent to the CoE, WSSC director of advising. The CoE, WSSC director of advising administers the decision in consultation with the chairperson or director of the engineering program to which the student seeks readmission. Significant improvement in academic performance and courses relevant to engineering are generally the basis for readmission into a CoE program following a period of suspension.

(For more information see: OU General Catalog, Office of Academic Records, Academic Probation and Suspension: http://catalog.ou.edu/current/index.html)

C. Transfer Students and Transfer Credits

Transfer students who meet the following criteria (1-4 below) minimums are instructed by the Office of Admissions to contact the CoE, WSSC for guidance on advisement and enrollment into courses. If engineering applicants do not meet the minimum GPA requirements listed below, these students can appeal their denied admission, and an Admission Referral will be sent to the CoE, WSSC director of advising. This decision to admit or deny is issued by the CoE, WSSC director of advising in consultation with the engineering program director.
1) **Transfer Students**

The OU Office of Admissions administers the admission of entering transfer students as follows:

Resident transfer-
- a) 2.5 combined GPA for students with less than 60 hours
  - or -
- b) 2.0 for students with 60 or more hours earned

The admission of non-resident transfer students is more restrictive for CoE programs, and is administered on the college’s behalf by the Office of Admissions and is as follows:

Non-resident transfer-
- a) 3.0 combined retention GPA regardless of the number of hours earned.

Note: Students who do not meet the minimum requirements for admission as a transfer student can petition the CoE. In such cases, a referral from the OU Office of Admissions is sent to the CoE, WSSC director of advising. The CoE, WSSC director of advising administers the decision in consultation with the chairperson or director of the engineering program to which the student seeks admission. Academic performance in courses relevant to an engineering curriculum is generally the basis for acceptance into a CoE program for a student otherwise inadmissible.

(For more information, see: University of Oklahoma, Office of Admissions home page, Undergraduate Admissions, Transfer: [http://www.ou.edu/content/admissions/home/requirements/undergraduate/transfer_admission.html](http://www.ou.edu/content/admissions/home/requirements/undergraduate/transfer_admission.html))

2) **Transfer Credits**

The Office of Admissions conducts all initial assessment of transfer coursework. Transfer students who wish to apply unequated transfer courses towards degree completion must meet with a WSSC academic advising professional for review. The advisor will instruct student regarding the process for final evaluation.

- Major specific coursework must be reviewed and approved by the CoE faculty in the specific engineering program in order to apply toward degree requirements. (e.g. mathematics courses are evaluated by the Department of Mathematics.)
- A CoE chairperson or director may elect to approve a course for any student with a specific course, from a specific institution. In these cases, a memo is sent to the director of OU Admissions, and the course is listed on the institution’s Transfer Equivalency Tables. [http://checksheets.ou.edu/tetables.htm](http://checksheets.ou.edu/tetables.htm)

Note: No upper-division engineering courses appear on the Transfer Equivalency Tables, which is in keeping with the CoE regulation that at least 24 hours of junior and senior courses in the major be completed in residence at OU and in the CoE.

3) **Cross-Campus Admits**

Students pursuing a major in another college on campus who wish to switch to an engineering program must meet with an academic advising professional in WSSC to change majors. The advising professional assesses the student’s GPA and completed courses. If the student lacks necessary preparation to begin coursework in the major, the advising professional may
recommend the student remain in their current major until they are adequately prepared for an engineering curriculum.

In accordance with State Regents’ requirements, students are assigned to the degree pattern that was current at the time they entered the Oklahoma State System of Higher Education. http://checksheets.ou.edu/

4) State Mandated Articulation Agreements that Impact Engineering Programs
Beginning in 1996, the State Regents launched a program to facilitate the transfer of students within Oklahoma’s state system of higher education. The result is the current Oklahoma State Regents for Higher Education Course Equivalency Matrix which can be accessed electronically at: http://www.okhighered.org/transfer-students/course-transfer.shtml. The Regents have also established a policy that guarantees that the freshmen and sophomore level general education requirements are deemed satisfied for students who complete a two-year Associates of Arts or Associates of Science degree from an Oklahoma public college, and who transfer to a four-year university.

For these reasons, general education coursework readily transfers from Oklahoma colleges into OU, and more specifically, the CoE programs. Additionally, if the student has completed the Associates of Arts or Associates of Science, and he/she earned a D in one of the general education courses used to complete that degree, the CoE will accept the course toward degree completion unless it is a direct pre-requisite for an engineering course.

D. Advising and Career Guidance

To facilitate the advising and the degree certification process, the university purchased Degree Navigator (DN) from Decision Academic. DN is a web-based, 24/7 relational database system which enables students direct access regarding their progress towards degree completion.

The university’s student information system is currently a SunGard Higher Education Banner, relational, unified digital database. The students, faculty and staff portal into the Banner system via oZone. (See: http://www.sungardhe.com/)

In addition to DN and oZone, official curriculum sheets are produced each year by the OU Academic Bulletins Office. Curriculum sheets and the associated degree patterns apply to one academic year, beginning with the summer term. In accordance with State Regents’ requirements, students are assigned to the degree pattern that was current at the time they entered the Oklahoma State System of Higher Education. Within the CoE, degree programs remain current for six years after which they are deemed expired, and any student in such a program is moved to a current program year by an advisor in WSSC. Students may elect to move to a more recent program year, and CoE department or program chairs may elect to extend an engineering program beyond six years, (not to exceed ten) if a student situation warrants such action, i.e. deployment, health issues, etc.

1) Advising Process
   a) Freshmen
All incoming freshmen, including engineering majors, are advised during the university’s summer enrollment and orientation program. This program is coordinated by University College (UC) and the OU Scholars Program. Freshmen must continue to be advised by a UC academic advising professional each semester until:

- completion of 24 credits (including AP, CLEP, Departmental and/or IB credit)
- at least one semester completed at OU
- possess the minimum 2.0 GPA

b) CoE Undergraduate Students

All engineering students with more than 24 hours earned, must be advised each semester by CoE faculty in their respective major. New engineering students are instructed to meet with an academic advising professional in WSSC for college intake session prior to advisement by a CoE faculty advisor in their respective program. Engineering students who are on Academic Contract, have questions about degree completion, require signatures on administrative forms or actions, or who require or seek additional guidance are directed to meet with WSSC academic advising professionals. With the use of DN as a tool, the majority of CoE students now attend Lean Cell advising sessions. In these sessions, CoE program specific faculty advisors, department staff and WSSC advising professionals are present at a predetermined advising venue. The process is as follows:

1. CoE students are required to be advised by faculty in their respective program each fall and spring semester. To ensure students are advised, an Advising Hold is placed on all engineering undergraduate students’ enrollment accounts prior to advanced enrollment for the subsequent semester or term.
2. At least one month prior to advanced enrollment, CoE Schools and Departments inform students in their programs by email, CoE E-Newsletter, and flyers about faculty advising schedules or Lean Cell Advising sessions.
3. Whether during office hours, or during Lean Cell Advising sessions, engineering students meet with a CoE faculty member for one-on-one advisement, during which time they are mentored and monitored regarding their progress towards degree completion. This is accomplished by review of the student’s DN record. Once the faculty advisor has conducted this review, he/she advises the student into an appropriate set of courses for the upcoming semester. Faculty advisors are required to enter notes regarding the student’s advisement into the student’s DN record. Notes entered in DN by faculty or staff cannot be altered.
4. Faculty or the student inform a WSSC advisor or designated staff to lift the student’s advising stop. This is typically done in person during a Lean Cell Advising session, or via email. Prior to lifting the advising stop, WSSC advisors or designated staff verify the advising notes have been entered.
5. Students are then able to enroll into classes using the oZone on-line enrollment system from anywhere they have internet access.

All ArchE students are assigned an individual CEES faculty advisor after they are admitted to the CoE. Faculty advisors provide guidance on enrollment and career paths within the ArchE program (i.e., mechanical electrical plumbing systems or structural engineering). CEES uses a Lean Cell process for enrollment advising. The week prior to the pre-enrollment period in the fall
and spring semesters, CEES schedules periods on three different days for the student to be advised. Students can select the day their individual advisor is in attendance or they can opt to be advised by any of the ArchE faculty. The Director of CEES attends all Lean Cell Advising sessions.

The Director of CEES does enrollment advising for all transfer students.

2) Career Guidance

The CoE faculty provide informal career advising to students during regular office hours or semester advising sessions. Additionally, the CoE hosts an annual Career Fair for students. All CoE students are encouraged, if not required to attend. Engineering students are also introduced to the resources available to them via the OU Career Services during the engineering orientation courses (ENGR 1410, Freshman Engineering Experience or ENGR 3510, Engineering Orientation Experience for Transfer Students), taken during their first semester at OU. These orientation courses also introduce the students to undergraduate research experience (REU) programs and graduate school. For the last two years, the college has hosted a Graduate School Fair for the undergraduate students. Additionally, CoE students may seek career guidance from faculty in their respective areas, as well as through their WSSC advisor.

The OU Career Services offers specialized services to students and alumni, such as:
- Job search and interviewing skills
- Resume and cover letter writing
- Major specific career advice
- Internship and job postings
- Information regarding Career Fairs, and on-campus interviews
(For more information, see the OU Career Services website: http://www.ou.edu/career/ )

E. Work in Lieu of Courses

In addition to accepting AP, CLEP, and IB credits, the CoE permits students who have mastered course content via work or military experience the option of credit per a Departmental (Advanced Standing) Exam in lower division courses. Such students must:
- Obtain an Advanced Standing form from the Office of Admissions and receive approval from the department responsible for awarding such credits prior to sitting for an exam.
- Once approved, the student submits the signed form to the Office of Admissions along with the exam fee which is $25 per credit hour for the course in which he/she intends to receive credit.
- The department arranges for a proctor, and determines the place and time of the exam.
- The department reports a grade of S for exam scores of 70% (C) or higher, U for scores of 69% (D) or less. Note: Only S grades for Departmental exams are posted to the student’s record.

F. Graduation Requirements
The CoE monitors closely the progression and completion of degree requirements for all engineering students. Additionally, CoE students are encouraged to request a degree check at any time during their academic career. The process is as follows:

- Students complete and submit a request for a graduation/degree check to WSSC usually one semester prior to the term they expect to graduate.
- At the time of the request, the student is also given the Senior Exit Survey and the official Application for Graduation.
- The WSSC academic advising professional responsible for graduation certification for the respective area conducts the graduation/degree check using the DN degree audit and responds by e-mail the results of the degree check.
- After grades are posted for the student’s final term and the student has successfully completed all final courses and meets all graduation requirements, the WSSC academic advising professional certifies the student’s degree.
- The Director of Advising conducts a final check of all degrees certified, and submits a final list to the Office of Academic Records by the established deadline which is typically four weeks after the end of the fall and spring semesters, and summer term.

The student’s graduation file will contain the following documents:

- **Student’s final Graduation Description (Report) with Exceptions from DN.** The name of the degree (Bachelor of Science in Architectural Engineering), the name of the person who certified degree completion and the date are included in this report.
- **Curriculum Sheet listing degree requirements for the student’s program year.**
- **Copy of the student’s advising Notes and documentation of any approved substitutions or exceptions to the student’s degree requirements.**
- **Transfer courses applied toward the degree, but not listed on the Transfer Equivalency Tables are included in the notes and documentation in the student record and file.**

**G. Transcripts of Recent Graduates**

The University of Oklahoma Official Transcript is arranged as follows:

The top block of the University of Oklahoma official transcript lists the following:

- **Course Level:** (Undergraduate, Graduate or Law)
- **Awarded:** BS in (Electrical Engineering for example)
  - Major/Concentration ( )
  - Minor ( )
CRITERION 2. PROGRAM EDUCATIONAL OBJECTIVES

A. Mission Statement

The mission statement for OU reads as follows:

The mission of the University of Oklahoma is to provide the best possible educational experience for our students through excellence in teaching, research and creative activity, and service to the state and society.

The following vision statement for the CoE was extracted from the College Strategic Plan:

To produce graduates and knowledge sought first in tomorrow’s technology-driven world.

The following departmental Mission Statement is found in the CEES Undergraduate Student Handbook, which is provided to each student majoring in Architectural Engineering.

The mission of the School of Civil Engineering and Environmental Science is to provide a high-quality educational experience for undergraduate and graduate students in the areas of architectural, environmental, geotechnical, structural, and transportation engineering and environmental science. The educational experience is accomplished through innovative classroom instruction aided by computer and multimedia-based instruction, laboratory experiences and student mentoring. The products of this experience are engineers and scientists capable of critical thinking, devoted to a lifetime of learning, and highly sought after by employers.

B. Program Educational Objectives

Program Educational Objective 1: The Architectural Engineering Bachelor of Science alumni will have embarked on successful careers in areas associated with the development, implementation, and management of architectural engineering systems.

Program Educational Objective 2: The Architectural Engineering Bachelor of Science alumni will advance in their careers and continue their professional development through continuing education and lifelong learning.

The Program Educational Objectives (PEOs) are listed on the departmental web site (www.cees.edu) and in the CEES Undergraduate Student Handbook, which is provided to each student majoring in Architectural Engineering.

C. Consistency of the Program Educational Objectives with the Mission of the Institution
By providing the best possible educational experience for our students, we are training qualified engineers who can embark on successful careers and are devoted to continuing education and lifelong learning.

D. Program Constituencies

The PEOs were developed to meet the needs of the constituencies of the ArchE program. The primary constituents of ArchE program are the students, both during their academic careers and later as alumni. Other constituencies of the ArchE program include the CEES faculty and industries and governmental agencies that employ our graduates. The PEO’s are focused on providing well trained engineers for employers and to empower these engineers to advance during their careers.

E. Process for Revision of the Program Educational Objectives

The original PEOs were born out of the CEES Departmental Assessment Plan beginning in 1998. In the spring of 1998, CEES established an ABET 2000 Committee, with the Assessment Plan Director serving as chair of the Committee. The Committee Chair attended an on-campus ABET 2000 workshop during the fall semester and a subsequent ABET 2000 Evaluator Workshop in January, 1999.

During the fall of 1998, the CEES ABET 2000 Committee met twice to develop and refine “draft” program educational objective statements and supporting materials (e.g., mission statement, desired outcomes, assessment methods, etc.). These materials were distributed to the CEES faculty for review and discussion. Revised statements were developed based on individual faculty (written) feedback and group discussions.

The revised statements were presented to the CEES alumni advisory board (a.k.a., CEES Visiting Council - VC) prior to their fall 1998 meeting. Written comments were solicited from VC members and the Program Educational Objectives were allocated time for discussion during the campus meeting. The ABET 2000 Committee Chair and the Acting Director solicited feedback from the VC during the fall meeting. The Program Educational Objectives and supporting materials were again revised based on input from the VC.

Final draft Program Educational Objectives were distributed to the CEES faculty late in the fall semester. Copies of the final draft statements and supporting materials were mailed to the CEES Visiting Council members prior to their spring 1999 campus visit. The ABET 2000 materials were again allocated time for discussion during the spring 1999 VC campus meeting.

At the end of each Spring semester, CEES faculty participate in a faculty retreat where student exit interviews, course evaluations and input from the assessment committees are discussed and reviewed. As a result of these discussions, updates and strategic actions are suggested.

During the spring 2004 faculty retreat, CEES faculty reviewed the PEOs and concluded that the statements were more focused on “outcomes” than “objectives”. The faculty decided to revise the PEOs. The guiding principles for revising the PEOs were: 1) they had to be applicable to
“graduates” of the program, and 2) they had to be “measurable”, i.e., the objective could be quantitatively assessed.

The revised Program Educational Objectives and Outcomes were presented to the VC prior to their fall 2004 meeting. Written comments were solicited from VC members and the Program Educational Objectives and Outcomes were allocated time for discussion during the campus meeting. The Program Educational Objectives, Outcomes and supporting materials were again revised based on input from the VC. It is important to note that the Chairman of the VC is a practicing architectural engineer and is co-owner of an architectural engineering firm in Tulsa, Oklahoma.

As noted in Section 1.B, up until 2004, the program was titled Engineering Pre-Architecture and was administered through the (CoE) Dean’s Office. In the spring of 2005, the Oklahoma State Regents for Higher Education officially approved the ArchE program. The revised PEOs were incorporated into the ArchE Self Study document in July 2005.

The PEOs are reviewed every 6 years, at least one year in advance of preparation of the Self Study document, as part of the overall assessment process (Figure 2-1). The PEOs were last reviewed at the spring 2010 retreat. CEES faculty feel that the current PEOs are still relevant; hence, they have not changed since the last General Review. CEES faculty have focused their efforts on improving the response rates for the PEO assessment instruments.
CRITERION 3. STUDENT OUTCOMES

A. Student Outcomes

Student Outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills, and behaviors that students acquire as they progress through the ArchE program. The student outcomes for the ArchE program are listed below. These outcomes are identical with the ABET EAC Criterion 3 outcomes. The student outcomes are:

(a) an ability to apply knowledge of mathematics, science, and engineering
(b) an ability to design and conduct experiments, as well as to analyze and interpret data
(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
(d) an ability to function on multidisciplinary teams
(e) an ability to identify, formulate, and solve engineering problems
(f) an understanding of professional and ethical responsibility
(g) an ability to communicate effectively
(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
(i) a recognition of the need for, and an ability to engage in life-long learning
(j) a knowledge of contemporary issues
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

B. Relationship of Student Outcomes to Program Educational Objectives

All of the student outcomes support both of the PEOs objectives to some extent; however, the association is stronger in some cases than others, particularly since the PEOs focus on our graduates’ accomplishments during the first three to five years after graduation. Table 3-1 indicates the particularly strong associations between each Student Outcome and the PEO(s). As noted in Section 2.E, the relationships between PEOs and Student Outcomes were established through a series of meetings of the CEES faculty and were presented to the CEES alumni advisory board.
### Table 3-1  Relationship Between Student Outcomes and Program Educational Objectives

<table>
<thead>
<tr>
<th>Student Outcome</th>
<th>PEO 1: ArchE alumni will have embarked on successful careers in areas associated with the development, implementation, and management of architectural engineering systems.</th>
<th>PEO 2: ArchE alumni will advance in their careers and continue their professional development through continuing education and lifelong learning.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)  an ability to apply knowledge of mathematics, science and engineering</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>(b)  an ability to design and conduct experiments, as well as to analyze and interpret data</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>(c)  an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>(d)  an ability to function on multidisciplinary teams</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>(e)  an ability to identify, formulate, and solve engineering problems</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>(f)  an understanding of professional and ethical responsibility</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>(g)  an ability to communicate effectively</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>(h)  the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>(i)  a recognition of the need for, and an ability to engage in life-long learning</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>(j)  a knowledge of contemporary issues</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>(k) an ability to use the techniques, skills and modern engineering tools necessary for engineering practice</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>
CRITERION 4. CONTINUOUS IMPROVEMENT

A. Program Educational Objectives

1. Process for Assessing PEOs

The primary processes for assessing the PEOs are: 1) the Student Exit Interviews, 2) Pass Rates on the Fundamentals of Engineering (FE) examination, and 3) the biennial Alumni survey.

Student Exit Interviews - The primary purpose of the Student Exit Interviews is to ascertain whether a student has a job at the time of graduation (PEO #1) or if they are going to pursue a graduate degree (PEO #2). The Student Exit Interviews are also the last opportunity to collect contact information for the subsequent Alumni (and Employer) surveys.

FE Examination – Students in ArchE are required to attempt the FE examination. Record of attempting the FE examination is a departmental requirement for graduation. In exchange for a “good faith” effort on the FE examination, the CEES department pays the first examination fee for each student. The pass rate of ArchE students on the FE examination is monitored and compared to national averages. Passing the FE examination is one of the primary steps in the process of becoming a licensed Professional Engineer (PE) with actually addresses PEO #2.

Alumni Surveys - The primary purpose of the Alumni surveys is to assess career advancement and/or continuing education (PEO #2) for graduates of the ArchE program.

The expected levels of attainment for the PEOs are as follows:

PEO#1 - Sixty percent of the graduates of the ArchE actively pursuing employment will find a job within five years after graduation.

PEO#2 - Seventy percent of the students completing the ArchE program will advance in their careers through professional accomplishments (e.g., professional registration, promotions) and/or continuing education (e.g., professional development hours, graduate degree) within five years after graduation.

2. Frequency of Process and Documentation of Results

Student Exit Interviews – Graduating seniors are interviewed in the semester (fall or spring) in which they are scheduled to graduate. The answers on the Student Exit Interview Questionnaire and the Oral Exit Interview Recording Form are catalogued and summary statistics are presented in the annual ArchE Outcomes Assessment Report.

FE Examination – CEES receives reports on student performance after the fall (October) and spring (April) examinations. The pass rate of ArchE students on the FE examination is compiled and reported in the annual ArchE Outcomes Assessment Report. Student performance is compared to national averages and analyzed for trends over time. The information is distributed to the CEES faculty for review and discussion during the annual faculty retreat. The results of the FE examination are also reported to the CEES Visiting Council each fall.
Alumni Surveys – The surveys are conducted every other year and are sent to recent (< five years out) graduates and the employers of the graduates. The answers to these surveys are collected and summarized in the annual ArchE Outcomes Assessment Report.

3. Summaries of Results

Student Exit Interviews - Three of the students who graduated from the ArchE program in AY 09-10 took jobs with Architectural Engineering firms. The fourth AY 09-10 graduate opted for graduate school. The size of the sample population of graduating seniors is too small to discern any meaningful trends.

FE Examination - Table 4-1 shows the performance of ArchE students on the FE examination since the last General Review. Seven ArchE students attempted the FE examination in AY 09-10 and three (43%) of them passed the test. The average pass rate over the past four years is 44%.

Alumni Survey - The results of the questions on the 2010 Alumni survey focusing on career advancement and/or continuing education are shown below [Note: the results were not available at the time of the 2009-10 ArchE Outcomes Assessment Report was prepared]. The response rate was very low (<8%) and the size of the sample population of ArchE alumni is too small to discern any meaningful trends.

3. What professional registrations or licenses do you hold? Please select all that apply.

<table>
<thead>
<tr>
<th>Response Total</th>
<th>Response Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineer-in-Training (EIT)</td>
<td>1</td>
</tr>
<tr>
<td>Professional Engineer (PE)</td>
<td>0</td>
</tr>
<tr>
<td>MD</td>
<td>0</td>
</tr>
<tr>
<td>None</td>
<td>0</td>
</tr>
<tr>
<td>Other (CPS, QEP, etc.) please specify</td>
<td>0</td>
</tr>
</tbody>
</table>

10. Within the last five years have you obtained any of the following? Please select all that apply.

<table>
<thead>
<tr>
<th>Response Total</th>
<th>Response Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promotion</td>
<td>0</td>
</tr>
<tr>
<td>Graduate Degree</td>
<td>1</td>
</tr>
<tr>
<td>Professional Degree (such as MBA)</td>
<td>0</td>
</tr>
<tr>
<td>P.E. or similar registration</td>
<td>0</td>
</tr>
<tr>
<td>None of the above</td>
<td>0</td>
</tr>
<tr>
<td>Other, please specify</td>
<td>1</td>
</tr>
</tbody>
</table>

Total Surveys Sent – 13
Total Respondents – 1
### Table 4-1 Pass Rates of AE Students on the FE Examination

<table>
<thead>
<tr>
<th>Exam Date</th>
<th>Apr 07</th>
<th>Oct 07</th>
<th>Apr 08</th>
<th>Apr 09</th>
<th>Oct 09</th>
<th>Apr 10</th>
<th>Totals for Four Years</th>
<th>09/10 National Averages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of AE Examinees</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>6</td>
<td>18</td>
<td>52</td>
</tr>
<tr>
<td>Number of AE's Passing Exam</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>8</td>
<td>38</td>
</tr>
<tr>
<td>Percent of AE's Passing Exam</td>
<td>67</td>
<td>0</td>
<td>50</td>
<td>50</td>
<td>100</td>
<td>33</td>
<td>44</td>
<td>73</td>
</tr>
</tbody>
</table>
B. Student Outcomes

1. Process for Assessing Student Outcomes

The primary methods for assessing Student Outcomes are: 1) Student Exit Interviews, 2) Performance on the FE examination, and 3) the Content-Based Assessment plan.

Outcomes Assessment Methods

Student Exit Interviews - Each student completing the baccalaureate program in ArchE must schedule and attend an exit interview with a member of the CEES Visiting Council during the semester in which s/he plans to graduate. Students fill out a questionnaire prior to attending the oral exit interview. As depicted in Table 4-2, one portion of the Student Questionnaire is devoted to student opinions relative to the Student Outcomes. Student responses during the oral exit interview are recorded on a separate form.

FE Examination – Students in ArchE are required to attempt the FE examination. Record of attempting the FE examination is a departmental requirement for graduation. In exchange for a “good faith” effort on the FE examination, the CEES department pays the first examination fee for each student. The performance of ArchE students for select topics on the FE examination is monitored and compared to national averages.

Content-Based Assessment of Criterion 3 “a to k” Student Outcomes. Starting in 2007, CEES began implementing a content-based process specifically addressing the Criterion 3 “a to k” Student Outcomes in each required CEES course in the ArchE curriculum. A mapping of the outcomes assessed in each course is shown in Table 4-3. The quantitative methods used to assess Student Outcomes listed in Table 4-3 are summarized below.

1. Monitor scores on target homework – CEES faculty have identified basic concepts which the students should learn in each course. Performance on homework questions specifically targeting these basic concepts is evaluated. Statistics are compiled for each target question. A satisfactory grade for each question is 70% (or C grade) or higher. The criterion for assessing whether the concepts have been adequately conveyed to the students would be 70% or higher of all students obtaining a satisfactory grade on all of the target questions.

2. Monitor scores on target exam questions – CEES faculty have identified basic concepts which the students should learn in each course. Performance on exam questions specifically targeting these basic concepts is evaluated. Statistics are compiled for each target question. A satisfactory grade for each question is 70% (or C grade) or higher. The criterion for assessing whether the basic concepts have been adequately conveyed to the students would be 70% or higher of all students obtaining a passing grade on all of the target questions.
Table 4-2 Student Exit Interview Questionnaire Regarding Student Outcomes

<table>
<thead>
<tr>
<th>Please assess your ability and/or knowledge gained in the following areas</th>
<th>Excellent</th>
<th>Very Good</th>
<th>Adequate</th>
<th>Needs Improvement</th>
<th>Needs Considerable Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) an ability to apply knowledge of mathematics, science and engineering</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>(b) an ability to design and conduct experiments, as well as to analyze and interpret data</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>(d) an ability to function on multidisciplinary teams</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>(e) an ability to identify, formulate, and solve engineering problems</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>(f) an understanding of professional and ethical responsibility</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>(g) an ability to communicate effectively</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>(i) a recognition of the need for, and an ability to engage in life-long learning</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>(j) a knowledge of contemporary issues</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>(k) an ability to use the techniques, skills and modern engineering tools necessary for engineering practice</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
3. **Monitor scores on interim deliverables and/or final project reports** – Many courses contain semester design projects. Performance on the interim and/or final project reports will be evaluated. A satisfactory grade for each deliverable is 70% (or C grade) or higher for each student or design team. The criterion for assessing whether the concepts have been adequately conveyed to the students would be 70% or higher of all students or design teams obtaining a satisfactory grade on all of the deliverables.

4. **Monitor scores on laboratory and/or project reports** – Many courses are accompanied by laboratory sessions which include experiments, data analysis, and report writing. The laboratory reports will be evaluated relative to the ability to design/conduct experiments, data analysis/interpretation, and communications. A satisfactory grade for each report would be a composite grade of 70% (or C grade) or higher. The criterion for assessing whether the ability to design/conduct experiments, data analysis/interpretation, and communications have been adequately conveyed to the students would be 70% or higher of students obtaining a satisfactory grade on all of the laboratory reports.

5. **Monitor online laboratory quizzes** – Some courses are accompanied by online laboratory quizzes. The laboratory quizzes will be evaluated relative to the ability to design/conduct experiments and data analysis/interpretation. A satisfactory grade for each quiz would be a composite grade of 70% (or C grade) or higher for each student. The criterion for assessing whether the abilities to design/conduct experiments and to analyze/interpret data have been adequately conveyed to the students would be 70% of students obtaining a satisfactory grade on the quizzes.

6. **Monitor peer evaluation scores** – Many classes incorporate semester design projects involving multi-disciplinary teams. Individual student performance is evaluated through peer evaluations administered at least three times during the course of the semester. The peer evaluation scores are compiled and statistics are calculated. The performance of individuals is compared within a given team and team performances are compared between each other. Students with low peer evaluation scores are informed immediately in order to allow for improvement. At the end of the semester the overall peer evaluation scores are computed and used to determine course grades. The ability to function on a multi-disciplinary team will be reflected by a student scoring less than two standard deviations away from the team average overall score. The criterion for assessing whether the ability to function on multi-disciplinary teams has been adequately conveyed to the students would be 70% or higher of all students scoring less than two standard deviations away from their team average scores.

7. **Monitor ethical case study scores** – Ethics and professional responsibility concepts have been incorporated into select courses. Performance on homework questions specifically targeting these concepts is evaluated. Statistics are compiled for each target question. A satisfactory grade for each question is 70% (or C grade) or higher. The criterion for assessing whether the concepts of ethics and professional
responsibility have been adequately conveyed to the students would be 70% or higher of students obtaining a satisfactory grade on all of the target questions.

8. **Monitor design project presentation scores** - Select courses involve semester design projects which culminate in an oral presentation. Oral presentation scoring forms are completed by the audience and the results are compiled. A satisfactory grade for each presentation is 70% (or C grade) for a student or design team. The criterion for assessing whether the concept of oral presentation has been adequately conveyed to the students would be 70% or higher of students or design teams obtaining a satisfactory grade on all of the evaluation forms.

9. **External evaluation of design project reports and presentations** – Select courses involve semester design projects which culminate in a project report and oral presentations. The reports and oral presentations are evaluated by a review board of practicing professionals. The review boards assess the project reports for technical quality, feasibility, compliance with current standards, and technical writing. The oral presentations are also evaluated by the review board. A satisfactory grade for each project report or presentation is 70% (or C grade) or higher from an individual reviewer. The criterion for assessing whether a given report is technically accurate and meets current standards would be an average score of 70% (or C grade) or higher for all of the reviews. The criterion for assessing whether the concepts have been adequately conveyed to the students would be 70% or higher of students obtaining a satisfactory grade on all project reports and presentations.

10. **Monitor RAT scores for self-guided learning** – Some classes utilize Readiness Assessment Tests (RATs) which in themselves promote self-study and learning how to learn. One of the RATs is a written essay regarding self-guided learning. The instructor evaluates each RAT submittal and provides a score. A satisfactory score for an individual RAT is 70% (or C grade) or higher. The criterion for assessing whether the concept of self-guided learning has been adequately conveyed to the students would be 70% or higher of the students obtaining a satisfactory score on the RAT.

11. **Monitor performance on software applications** - Several classes expose students to educational (e.g., Excel, West Point Bridge, ANSYS) and industry standard (e.g., MINEQL+, Water Cad) software. A satisfactory score for an individual submission is 70% (or C grade) or higher. The criterion for assessing whether the students have developed proficiency with either software program would be 70% or higher of the students successfully completing the homework assignments.

12. **Monitor attendance at Professional Development Seminar** – The CEES seminar class covers a variety of professional development issues (ethics, registration, management, globalization, life-long learning, etc). The majority of the classes involve guest speakers currently practicing engineering. Students are required to take at least four semesters of the seminar class to ensure student exposure to all topics more than once. Class attendance is recorded during the semester. The ABET criteria are assessed by tabulating attendance versus topic statistics. Each criterion is satisfied
by documenting that 90% of the students are exposed to the criterion through class attendance.

Table 4-3: Quantitative Methods Utilized to Assess ABET a to k Criteria

<table>
<thead>
<tr>
<th>ArchE Classes</th>
<th>ABET Criterion 3 “a to k” Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>AME 2213</td>
<td>2</td>
</tr>
<tr>
<td>AME 3173</td>
<td>1,2</td>
</tr>
<tr>
<td>AME 4653</td>
<td>1</td>
</tr>
<tr>
<td>CEES 1000</td>
<td></td>
</tr>
<tr>
<td>CEES 1112</td>
<td>1</td>
</tr>
<tr>
<td>CEES 2113</td>
<td>2</td>
</tr>
<tr>
<td>CEES 2153</td>
<td>2</td>
</tr>
<tr>
<td>CEES 2223</td>
<td>2</td>
</tr>
<tr>
<td>CEES 3253</td>
<td>1,2</td>
</tr>
<tr>
<td>CEES 3334</td>
<td>1,2</td>
</tr>
<tr>
<td>CEES 3364</td>
<td>2</td>
</tr>
<tr>
<td>CEES 3403</td>
<td>1,2</td>
</tr>
<tr>
<td>CEES 3414</td>
<td>1,2</td>
</tr>
<tr>
<td>CEES 3774</td>
<td>1,2</td>
</tr>
<tr>
<td>CEES 4113</td>
<td>2</td>
</tr>
<tr>
<td>CEES 4333G</td>
<td>2</td>
</tr>
<tr>
<td>CEES 4753G</td>
<td>1,2</td>
</tr>
<tr>
<td>CEES 4803</td>
<td></td>
</tr>
<tr>
<td>CEES 4993</td>
<td></td>
</tr>
<tr>
<td>Methods Used</td>
<td></td>
</tr>
</tbody>
</table>

2. Frequency of Process and Documentation of Results

**Student Exit Interviews** – Graduating seniors are interviewed in the semester (fall or spring) in which they are scheduled to graduate. The answers on the Student Exit Interview Questionnaire and the Oral Exit Interview Recording Form are catalogued and summary statistics are presented in the annual ArchE Outcomes Assessment Report. These results are also shared with the CEES faculty during the annual faculty retreat and any improvements/modifications needed for the curriculum are discussed.

**FE Examination** - The performance of ArchE students for select topics on the FE examination is compiled and reported in the annual ArchE Outcomes Assessment Report. Student performance is compared to national averages and analyzed for trends over time. The information is distributed to the CEES faculty for review and discussion during the annual faculty retreat. The results of the FE examination are also reported to the CEES Visiting Council each fall.

**Content-Based Assessment** - The Content-Based Assessment information is collected at least every other year a course is taught. Some instructors compile the information each time they
teach a course. The information is compiled and reported in the annual Outcomes Assessment Report. The information is distributed to the CEES faculty for review and discussion during the annual faculty retreat. Strategies to address problem areas are devised during the spring retreat and implemented in the subsequent academic year.

3. Summaries of Results

**Student Exit Interviews** - The information derived from the student exit interviews is used to assess almost all facets of the CEES educational enterprise. The information is distributed to the CEES faculty for review and discussion during the annual faculty retreat. Strategies to address problem areas are devised during the spring retreat and implemented in the subsequent fall semester.

Results from the questionnaires for the last four years are presented in Table 4-4. The results indicate the following:

- CEES faculty are apparently very good in conveying fundamental concepts to the students as evidenced by the responses to questions “a”. The average responses over the last four years for these two questions are above 90%.
- CEES faculty have effectively incorporated material related to ethics and professionalism (“f”) in courses throughout the undergraduate curriculum.
- Students have expressed dissatisfaction with knowledge of contemporary issues (“j). Contemporary issues are now specifically addressed in both the professional practice (e.g., ASCE Body of Knowledge) and capstone (e.g., LEED certification) courses.
- Students have expressed dissatisfaction with modern engineering tools (“k). This is attributable to the lack of training on AutoCad in the curriculum.

**FE Examination** - Table 4-5 shows the performance of ArchE students for select topics on the FE examination since the last General Review. The table shows ArchE students are near the national average for all of the topics with the exception of Engineering Economics.

**Content Based Assessment** - The results of the Content-Based Assessment for academic year 2010-2011 are summarized in Table 4-6. It is important to note that there is only one instance in which ArchE students did not meet the numeric criterion for a particular assessment method. Strategies for addressing the non-attainment situations are included in the content-based assessment information collected from each class. The content-based assessment information for each class listed in Table 4-6 will be available for review during the visit unless requested otherwise.

C. Continuous Improvement

**Program Educational Objectives**

As noted in Section 2.E, the PEOs were revised in 2004 to focus more on “graduates” of the ArchE program. The PEOs have not changed since the last general review. However, the target of the assessment methods is now “graduates of the program within a few years of graduation”.

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Table 4-4 Student Responses to ABET Criteria

<table>
<thead>
<tr>
<th>Has Curriculum Provided You With:</th>
<th>% Respondents Who Rated &quot;Very Good&quot; or &quot;Excellent&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. knowledge of math, science, and engineering?</td>
<td>100% 100% 100% 67% 92%</td>
</tr>
<tr>
<td>b. ability to conduct experiments and interpret data?</td>
<td>0% 75% 100% 67% 77%</td>
</tr>
<tr>
<td>c. ability to design systems to meet desired needs?</td>
<td>100% 50% 60% 67% 62%</td>
</tr>
<tr>
<td>d. ability to function on multi-disciplinary teams?</td>
<td>100% 100% 100% 33% 85%</td>
</tr>
<tr>
<td>e. ability to formulate and solve engineering problems?</td>
<td>0% 100% 60% 67% 69%</td>
</tr>
<tr>
<td>f. an understanding of professional/ethical responsibilities?</td>
<td>100% 100% 80% 67% 85%</td>
</tr>
<tr>
<td>g. ability to communicate (written and oral)?</td>
<td>100% 100% 100% 67% 92%</td>
</tr>
<tr>
<td>h. broad educational background?</td>
<td>0% 50% 100% 33% 61%</td>
</tr>
<tr>
<td>i. recognition of the need for life-long learning?</td>
<td>0% 100% 100% 67% 85%</td>
</tr>
<tr>
<td>j. knowledge of contemporary engineering issues?</td>
<td>0% 25% 40% 0% 23%</td>
</tr>
<tr>
<td>k. ability to use techniques, skills and modern engineering tools?</td>
<td>0% 50% 60% 33% 46%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>AY 06-07</th>
<th>AY 07-08</th>
<th>AY 08-09</th>
<th>AY 09-10</th>
<th>Weighted Average</th>
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<tbody>
<tr>
<td>Number of students interviewed</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>3</td>
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</table>
Table 4-5 Performance of AE Students on the FE Examination

<table>
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<tr>
<th>Exam Date</th>
<th>Apr 07</th>
<th>Oct 07</th>
<th>Apr 08</th>
<th>Apr 09</th>
<th>Oct 09</th>
<th>Apr 10</th>
<th>Average for Four Years</th>
<th>09/10 National Averages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject Area</td>
<td>Percent of Questions Answered Correctly by OU Architectural Engineering Examinees</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Engineering Economics</td>
<td>33</td>
<td>45</td>
<td>55</td>
<td>45</td>
<td>50</td>
<td>63</td>
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<td>Statics</td>
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<td>54</td>
<td>57</td>
<td>38</td>
<td>78</td>
<td>58</td>
<td>56</td>
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<tr>
<td>Mechanics of Materials</td>
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<td>38</td>
<td>47</td>
<td>43</td>
<td>50</td>
<td>59</td>
<td>51</td>
<td>52</td>
</tr>
<tr>
<td>Fluid Mechanics</td>
<td>46</td>
<td>56</td>
<td>56</td>
<td>38</td>
<td>38</td>
<td>66</td>
<td>50</td>
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Table 4-6: Results of Quantitative Assessment of ABET a to k Criteria

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<tr>
<th>ArchE Classes</th>
<th>AME 2213</th>
<th>AME 3173</th>
<th>AME 4653</th>
<th>CEES 1000</th>
<th>CEES 1112</th>
<th>CEES 2113</th>
<th>CEES 2153</th>
<th>CEES 2223</th>
<th>CEES 3253</th>
<th>CEES 3334</th>
<th>CEES 3364</th>
<th>CEES 3403</th>
<th>CEES 3414</th>
<th>CEES 3774</th>
<th>CEES 4113</th>
<th>CEES 4333G</th>
<th>CEES 4753G</th>
<th>CEES 4803</th>
<th>CEES 4993</th>
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<tr>
<td></td>
<td>a</td>
<td>b</td>
<td>c</td>
<td>d</td>
<td>e</td>
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<td>m</td>
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<td>CEES 1000</td>
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</tr>
<tr>
<td>Y = &gt; 70% of AE students satisfied the criterion</td>
<td>12</td>
<td>4</td>
<td>8</td>
<td>2</td>
<td>12</td>
<td>2</td>
<td>7</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>8</td>
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<tr>
<td>n = &lt; 70% of AE students satisfied the criterion</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tr>
</tbody>
</table>

NA – content-based assessment information is not available until Fall 2011 semester

The Alumni survey was revised in 2010 and sent to ArchE alumni who were within 5 years of graduation.

**Alumni Survey** - The Alumni survey used for assessing the PEOs was updated in 2010. The content of the Alumni survey is now more focused on assessment of PEO #2. The alumni are now specifically asked the following:

3. What professional registrations or licenses do you hold? Please select all that apply.*
   - Engineer-in-Training (EIT)
   - Professional Engineer (PE)
   - MD
   - None
   - Other (CPS, QEP, etc.) please specify
10. Within the last five years have you obtained any of the following? Please select all that apply.*

Promotion
Graduate Degree
Professional Degree (such as MBA)
P.E. or similar registration

The Alumni and Employer Survey forms have also been changed to be more “user friendly” in an attempt to increase participation. The surveys are now administered online through a web site that provides the raw data plus data analysis. CEES switched the questionnaires to electronic format on SelectSurvey.NET, which is a web-based survey creation tool that can be used to quickly and easily distribute surveys via e-mail or a web site. It is a user-friendly application that allows the user to create surveys using over 20 different item/question types including choice, matrix and open ended questions. The results are tracked in real-time by using built-in reporting tools that include statistical summaries of question responses. The University of Oklahoma IT Services makes SelectSurvey.NET available to OU faculty and staff.

Student Outcomes

Student Exit Interviews – The most important information is derived from the “comments” noted on both the Student Exit Interview Questionnaire and the Oral Exit Interview Recording Form. The student comments focus mainly on curriculum content and faculty performance. As a result of the feedback derived from these two forms, CEES has made the following changes in the ArchE program since the last General Review:

1. In 2006, the Introduction to CEES class (CEES 1112) was increased to two hours to cover more computer software and design applications in the freshman class.

2. In 2008, CEES implemented a four-hour combined Concrete and Steel Design class (CEES 3774) to ensure that architectural engineering students get exposed to design procedures for both concrete and steel.

3. In 2011, CEES changed the ArchE curriculum to include a course on Computer Aided Design (CEES 1213) to provide students with training on the use of AutoCad.

FE Examination – Starting in 2008, Engineering Economics was included in the fall Professional Practice course (CEES 4803) which should improve performance on that topic.

Content Based Assessment – The implementation of the Content Based Outcomes Assessment Process in 2007 was, in itself, a dramatic improvement for the overall evaluation process relative to Student Outcomes. The decision to implement a content based process required the CEES faculty to complete several tasks relative to improving the ArchE program including:

i. Reviewing and familiarizing themselves with the Criterion 3 “a to k” Student Outcomes. The accreditation process was discussed at the Spring 2010 retreat and during several faculty meetings during the 2010-11 academic year. All of the faculty teaching in the ArchE program (not just the Director and ABET
Coordinators) are now at least familiar with the ABET accreditation process and the Criterion 3 Student Outcomes.

ii. Identify which of the Student Outcomes are addressed in their course(s). This task resulted in significant improvements for most of the ArchE program courses. The task required faculty to assess or re-assess the learning outcomes for their courses, an effort that was not previously required. This task will now be repeated each time a course is offered.

iii. Develop methods for quantitatively assessing each of the Student Outcomes in their course(s). This task required that faculty teaching in the ArchE program develop grading rubrics and metrics for quantitatively assessing student outcomes. This has reduced the “subjectivity” of both the grading and assessment processes.

iv. Revise the content and format of their course(s), as needed, to address the Student Outcomes. This task required the faculty to evaluate or re-evaluate the content in their courses, an effort that was not previously required. This task will now be repeated each time a course is offered.

v. Implement the quantitative assessment methods. This task represented a dramatic change for most faculty teaching in the ArchE program. The task requires that faculty evaluate their performance relative to the Student Outcomes, rather than just compiling scores and submitting grades at the end of a semester. This task will now be repeated each time a course is offered.

**Future Changes** - After reviewing the assessment results, faculty in the program have identified several improvements that need to be implemented.

**Educational Program Objectives**

i. CEES needs to identify measures for better tracking ArchE students after they graduate, especially job placement and graduate education. The Director of CEES will take this issue forward to the CoE administration, including Directors of other programs, for discussion and brainstorming in the Fall 2011 semester.

ii. In Fall 2011, CEES will establish LinkedIn and Facebook sites and will start posting Alumni survey announcements, requesting participation by graduates from specifically defined years. CEES will continue to monitor response rates to the Alumni survey.

**Student Outcomes**

i. Several of the ArchE course content-based assessments identify course-specific changes that are needed to better address the selected Student Outcomes.
ii. In Fall 2011, CEES will develop a schedule for assessing specific courses and specific outcomes on a rotating basis.

iii. CEES needs to develop and implement course content that more fully addresses Student Outcome “h” regarding the broad education necessary to understand the impact of engineering solutions in a global environment. This issue will be discussed in faculty meetings starting with the Fall 2011 semester.

D. Additional Information

The following materials will be available for review during the campus visit unless requested otherwise:

- Architectural Engineering Outcomes Assessment Report
- Student Exit Interview Questionnaire
- Oral Exit Interview Recording Form
- Alumni Survey Questionnaire
- Student Employer Questionnaire
- Technology and Software Review Committee Report
- Content-based assessment results for each class listed in Table 4-6.
CRITERION 5. CURRICULUM

A. Program Curriculum

The undergraduate ArchE curriculum is shown in Table 5-1. The 126-hour curriculum is divided into eight semesters over a four-year period. The curriculum includes 32 hours of Math and Basic Sciences and 59 hours of Engineering Topics, both of which meet or exceed the minimal levels noted by ABET.

The undergraduate ArchE curriculum gives the student the required broad-based training, with some flexibility (Professional Elective) to allow for some degree of specialization. It is important to note that all AE students are required to attempt the FE exam prior to graduation. Successful completion of an ABET accredited degree plan and passing the FE are two keys steps in the process of becoming a licensed Professional Engineer. The AE degree requirements prepare graduates for careers in engineering. The requirement of the FE and emphasis on professional registration help instill the need for lifelong learning.

Figure 5-1 shows the prerequisite structure support and the structure of the program’s required courses.

The undergraduate ArchE curriculum requires coursework from: history of architectural design (history of architecture – 3 credits), architecture (architectural studio – 8 credits), structural engineering (analysis – 9 credits and design – 7 credits), civil engineering (civil engineering measurement – 4 credits, geotechnical engineering – 4 credits analysis and 3 credits design, and materials – 3 credits), and building mechanical (6 credits analysis, 3 credits design) and electrical (3 credits analysis, 3 credits design) systems, 3 credits of professional electives, plus the two semester capstone sequence.

The General Education requirements at OU, along with the faculty advising system, guarantee that each student will have breadth and depth in their education. Two courses are required in the social sciences. Humanities are divided into three areas: "understanding artistic forms" (3 credits, one course); "western civilization and culture" (6 credits, two courses); and "non-western culture" (3 credits, one course). Courses to be accepted for general education credit are vetted by the Provost’s Advisory Committee on General Education Oversight (PACGEO). Faculty advisors emphasize the depth requirement which is also discussed in the CEES Undergraduate Student Handbook.

Course syllabi are included in Appendix A. Other course materials such as textbooks, and samples of student work will be available for review during the visit.
<table>
<thead>
<tr>
<th>Course</th>
<th>Indicate Whether Course is Required, Elective or a Selected Elective by an R, an E or an SE</th>
<th>Curricular Area (Credit Hours)</th>
<th>Engineering Topics Check if Contains Significant Design (√)</th>
<th>General Education</th>
<th>Other</th>
<th>Last Two Terms the Course was Offered: Year and, Semester, or Quarter</th>
<th>Average Section Enrollment for the Last Two Terms the Course was Offered</th>
</tr>
</thead>
<tbody>
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<td>MATH 2423 Calculus II</td>
<td>R</td>
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<td>PHYS 2514 General Physics I</td>
<td>R</td>
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<tr>
<td>Sophomore, Fall Semester</td>
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<tr>
<td>ARCH 2243 Hist. Built Env. I</td>
<td>R</td>
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<td>F09, F10</td>
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<td>HIST 1483 U.S. 1492-1865 or HIST 1493 U.S. 1865-Present</td>
<td>R</td>
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Table 5-1 Curriculum
Architectural Engineering
<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Notes</th>
<th>Terms</th>
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<tbody>
<tr>
<td>CEES 2113 Statics and Dynamics</td>
<td>R</td>
<td>3.0</td>
<td>F09, F10</td>
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<tr>
<td>CEES 1000 CEES Seminar</td>
<td>R</td>
<td>( )</td>
<td>F09, F10</td>
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<td>MATH 3113 Intro. to ODE</td>
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<td>CEES 1000 CEES Seminar</td>
<td>R</td>
<td>( )</td>
<td>F10, Sp11</td>
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<tr>
<td>CEES 2153 Mech. of Materials</td>
<td>R</td>
<td>3.0</td>
<td>Sp10, Sp11</td>
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<tr>
<td>CEES 2223 Fluid Mech.</td>
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<td>Sp10, Sp11</td>
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<td>R</td>
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<td>Sp10, Sp11</td>
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<tr>
<td>Junior, Fall Semester</td>
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<tr>
<td>AME 2213 Thermodynamics</td>
<td>R</td>
<td>3.0</td>
<td>F09, F10</td>
</tr>
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<td>CEES 1000 CEES Seminar</td>
<td>R</td>
<td>( )</td>
<td>F09, F10</td>
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<tr>
<td>CEES 3253 Intro. Cont. Mech.</td>
<td>R</td>
<td>3.0</td>
<td>F09, F10</td>
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<tr>
<td>CEES 3364 Soil Mechanics</td>
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<td>F09, F10</td>
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<tr>
<td>CEES 3414 Structural Analysis I</td>
<td>R</td>
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<td>F09, F10</td>
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<td>ENGR 2431 Electric Circuits</td>
<td>R</td>
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<td>F09, F10</td>
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<td>AME 3173 Heat Transfer.</td>
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<td>( )</td>
<td>F10, Sp11</td>
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<tr>
<td>CEES 3334 Measurements - Civil</td>
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<td>CEES 3403 Materials</td>
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<td>( )</td>
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<td>F10, Sp11</td>
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<td>CEES 4753 Structural Design - Wood</td>
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<td>F09, F10</td>
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<tr>
<td>CEES 4113 Build. Light &amp; Electrical Systems</td>
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<td>3.0</td>
<td>F09, F10</td>
</tr>
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<td>Course</td>
<td>Credits</td>
<td>Notes</td>
<td></td>
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<td>---------------------------------------------</td>
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<tr>
<td>Prof. Elective SE</td>
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<td>CEES 4993 Arch. Engr. Design (Capstone)</td>
<td>3.0</td>
<td>Sp10, Sp.11</td>
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<td>CEES 1000 CEES Seminar</td>
<td>3.0</td>
<td>F10, Sp 11</td>
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<tr>
<td>CEES 4333 Foundation Engr.</td>
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<td>Sp10, Sp11</td>
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<td>Core IV: Art Forms SE</td>
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<tr>
<td>Core III: Social Science</td>
<td>3.0</td>
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**TOTALS-ABET BASIC-LEVEL REQUIREMENTS**

|          | 32  | 59  | 18  | 17  |

**OVERALL TOTAL CREDIT HOURS FOR THE DEGREE**

|          | 126 |

**PERCENT OF TOTAL**

| Minimum Semester Credit Hours | 32 Hours | 48 Hours |
| Minimum Percentage            | 25%      | 37.5 %   |

NA – enrollment figures are Not Available for professional elective and general education courses.
Figure 5-1 Prerequisite Structure
CRITERION 6. FACULTY

A. Faculty Qualifications

The qualifications of the ArchE faculty are detailed in Table 6-1 and their resumes are included in Appendix B. Since the last accreditation visit, CEES has hired two new Assistant Professors in structural engineering. One senior structural engineering Professor resigned in December 2010. CEES also hired an Associate Professor in radar hydrology since the last review.

CEES has a total of 19 full time faculty members; eleven have a focus area in either environmental engineering (Drs. Butler, Dresback, Kibbey, Knox, Kolar, Sabatini, Strevett and Vieux) or environmental science (Drs. Hong, Nairn, Nanny); five have focus areas in geotechnical and transportation engineering (Drs. Cerato, Hatami, Miller, Muraleetharan, Zaman); and three have focus areas in structural engineering (Drs. Kang, Pei and Ramseyer). One geotechnical faculty member (Dr. Hatami) has a strong background in structural mechanics and teaches structural engineering courses. Seven of the junior faculty members have received the prestigious Faculty Early Career Development (CAREER) Award from the National Science Foundation. In addition, Dr. Cerato was selected as the first ever recipient from the University of Oklahoma for the Presidential Early Career Award in Science and Engineering (PECASE).

The ArchE program includes several courses that are common to multiple disciplines. The mechanical engineering courses (AME 2213, 3173, 4653) are taught by faculty from Aerospace and Mechanical Engineering (AME) as part of the AME programs. The Building Lighting and Electrical Systems course (CEES 4113) is required for all students in the ArchE program, but the instructor allows students from other disciplines to take the course if they satisfy the prerequisites. CEES 4113 is taught by an adjunct faculty member (Cliff Fitzmorris) from electrical engineering. There are several CEES courses that are common to both the ArchE and civil engineering programs that are taught by faculty from environmental engineering (CEES 2113, 2223, 2153, 3334, 4803), geotechnical engineering (CEES 3364, 3253, 4333) and structural engineering (CEES 3414, 3403, 3774). The Foundations Engineering course (CEES 4333) and Structural Design Wood (4753) are required for all students in the ArchE program, but civil engineers can take these courses as Professional Electives if they satisfy the prerequisites. CEES 4333 is taught by a geotechnical engineering faculty member. Due to personnel changes, CEES 4753 has recently been contracted out to a local practicing structural engineer (David Swyden). The ArchE capstone course is co-taught by a structural engineering faculty member (Dr. Kang) and a geotechnical engineering faculty member (Dr. Miller). Both instructors are licensed Professional Engineers with private industry experience.

Currently, eleven CEES faculty members are Registered Professional Engineers, and one faculty member is a Registered Geotechnical Engineer in California (the highest level of registration for a Geotechnical Engineer in the US). CEES requires that faculty teaching design-oriented courses pursue registration as a Professional Engineer.

CEES faculty are excellent teachers as evidenced by their various teaching awards: National – ASCE Arthur Casagrande Professional Development Award, Outstanding Educator of the Year
### Table 6-1. Faculty Qualifications

**Architectural Engineering**

<table>
<thead>
<tr>
<th>Faculty Name</th>
<th>Highest Degree Earned- Field and Year</th>
<th>Rank</th>
<th>Type of Academic Appointment</th>
<th>Years of Experience</th>
<th>Professional Registration/Certification</th>
<th>Level of Activity</th>
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<tr>
<td>Butler, Elizabeth</td>
<td>Ph.D., Env. Engr., 1998</td>
<td>P</td>
<td>T</td>
<td>FT</td>
<td>6, 13, 12</td>
<td>H, H, L</td>
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<tr>
<td>Cerato, Amy</td>
<td>Ph.D., Civ. Engr., 2005</td>
<td>ASC</td>
<td>T</td>
<td>FT</td>
<td>0, 7, 7</td>
<td>PE, H, H, L</td>
</tr>
<tr>
<td>Dresback, Kendra</td>
<td>Ph.D., Civ. Engr., 2005</td>
<td>AST</td>
<td>NTT</td>
<td>FT</td>
<td>7, 0, 7</td>
<td>H, H, L</td>
</tr>
<tr>
<td>Fitzmorris, Clifford</td>
<td>MS, Elec. Engr</td>
<td>AST</td>
<td>NTT</td>
<td>PT</td>
<td>19, 10, 4</td>
<td>H, H, L</td>
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<tr>
<td>Hatami, Kianoosh</td>
<td>Ph.D., Civ. Engr., 1997</td>
<td>ASC</td>
<td>T</td>
<td>FT</td>
<td>4, 14, 7</td>
<td>PE, H, H, L</td>
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<tr>
<td>Hong, Yang</td>
<td>Ph.D., Hydrology</td>
<td>ASC</td>
<td>TT</td>
<td>FT</td>
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<td>H, H, L</td>
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<td>Kang, Thomas</td>
<td>Ph.D., Civ. Engr.</td>
<td>AST</td>
<td>TT</td>
<td>FT</td>
<td>0, 7, 4</td>
<td>PE, H, H, L</td>
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<tr>
<td>Kibbey, Tohren</td>
<td>Ph.D., Env. Engr., 1997</td>
<td>P</td>
<td>T</td>
<td>FT</td>
<td>0, 12, 12</td>
<td>L, H, L</td>
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<td>Name</td>
<td>Degree, Discipline</td>
<td>Code</td>
<td>Type</td>
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<td>1st Year</td>
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<td>Miller, Gerald</td>
<td>Ph.D., Civ. Engr., 1994</td>
<td>P</td>
<td>T</td>
<td>FT</td>
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<td>Muraleetharan, Kanthasamy</td>
<td>Ph.D., Civ. Engr.</td>
<td>P</td>
<td>T</td>
<td>FT</td>
<td>6</td>
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<td>Nairn, Robert</td>
<td>Ph.D., Env. Sci.</td>
<td>ASC</td>
<td>T</td>
<td>FT</td>
<td>3</td>
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<td>Nanny, Mark</td>
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<td>P</td>
<td>T</td>
<td>FT</td>
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<td>Pei, Jinsong</td>
<td>Ph.D., Civ. Engr. &amp; Engr. Mech., 2001</td>
<td>ASC</td>
<td>T</td>
<td>FT</td>
<td>7.5</td>
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<td>Ramseyer, Chris</td>
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<td>AST</td>
<td>TT</td>
<td>FT</td>
<td>4.5</td>
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<tr>
<td>Sabatini, David</td>
<td>Ph.D., Civ. Engr., 1989</td>
<td>P</td>
<td>T</td>
<td>FT</td>
<td>3</td>
<td>23</td>
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<td>Strevett, Keith</td>
<td>Ph.D., Civ. Engr., 1995</td>
<td>P</td>
<td>T</td>
<td>FT</td>
<td>0</td>
<td>16</td>
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<tr>
<td>Vieux, Baxter</td>
<td>Ph.D., Civ. Engr., 1988</td>
<td>P</td>
<td>T</td>
<td>FT</td>
<td>10</td>
<td>22</td>
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<tr>
<td>Zaman, Musharraf</td>
<td>Ph.D. Civ. Engr., 1982</td>
<td>P</td>
<td>T</td>
<td>FT</td>
<td>0</td>
<td>28</td>
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</table>

1. Code:  P = Professor  ASC = Associate Professor  AST = Assistant Professor  I = Instructor  A = Adjunct  O = Other
2. Code:  TT = Tenure Track  T = Tenured  NTT = Non Tenure Track
3. CEES faculty provided individual evaluations of their levels of activity. The level of activity, high (H), medium (M) or low (L) reflects an average over 2009-2011.
Teaching both graduate and undergraduate students through research is an important objective of our faculty. Our success toward this goal can be observed through our external research expenditures, number of graduate degrees conferred, publication record, and journal citations. During FY10, our total research expenditures exceeded $4.35 million ($229K per FTE). The University has recognized our research efforts by bestowing faculty awards such as the Regents’ Award for Superior Research, Presidential Professorships and numerous Junior Summer Faculty Research Awards. CEES faculty have also won national and professional awards for research excellence. In 2011, Dr. Sabatini won the Water Environment Federation, Award of Merit with Distinction for work in developing countries. Also in 2011, Dr. Nairn received the Richard I. and Lela M. Barnhisel Reclamation Researcher of the Year Award from the American Society of Mining and Reclamation.

CEES faculty have also developed international collaborations in research and education. We currently have formal exchange agreements with Chulalongkorn University in Thailand, Thomas Frias University in Bolivia, and Blaise-Pascal in France. CEES faculty have also developed collaborative relationships with researchers at universities in Germany (University of Tuebingen), Cambodia, Ethiopia and the Peoples Republic of China.

CEES faculty are also very active in professional service at the national and international levels. Our faculty regularly serve on NRC and NSF review panels and as editors and reviewers for numerous refereed journals.

CEES faculty have been recognized by the University of Oklahoma for their outstanding performance. Dr. Knox is the Director of CEES and occupies the Ted A. Kritikos Chair and is also a Presidential Professor. Dr. Sabatini occupies the Sun Oil endowed Chair and is a David Ross Boyd Professor. Dr. Zaman occupies the Aaron Alexander endowed Professorship and is a David Ross Boyd Professor. Dr. Muraleetharan occupies the Kimmell-Bernard Chair in Engineering and is also a David Ross Boyd Professor. Dr. Vieux occupies the Joseph A. Brandt Professorship. Dr. Kolar is the Lloyd Austin Presidential Professor.

B. Faculty Workload

Workload

CEES defines a fully-obligated faculty member (1 FTE) as being involved in an appropriate level of research and service, plus three courses per year. Faculty members in CEES are expected to teach at least one course per semester. The following typical distribution of activities would be assumed by 1 FTE:
<table>
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<tr>
<th>Semester 1</th>
<th>Semester 2</th>
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<tbody>
<tr>
<td>Course 1</td>
<td>0.25 FTE</td>
</tr>
<tr>
<td>Course 2</td>
<td>0.25 FTE</td>
</tr>
<tr>
<td>Prof. &amp; Univ. Serv.</td>
<td>0.05 FTE</td>
</tr>
<tr>
<td>Research &amp; Scholarly Act.</td>
<td>0.45 FTE</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1.00 FTE</td>
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</table>

The primary measures of research and scholarly activity are articles in archival journal publications or the equivalent (e.g., refereed conference proceedings, book chapters, or other refereed forums) and research expenditures. In addition, proposals must be written and submitted. For service, faculty must participate in the academic life of the university and also play an active role in professional organizations at the national level (e.g., reviewing articles and proposals, serving on technical, conference, and editorial committees, and editing archival publications).

If an appropriate level of output from service, research and scholarly activity is deemed inadequate to comprise 0.50 FTE, additional teaching responsibilities can be assigned. A faculty member without research and scholarly activity can be required to teach up to four courses per semester as a 1.0 FTE obligation. Owing to the productivity of the faculty, CEES has not had to assign more than three courses to any faculty member since the last General Review. Table 6-2 summarizes recent faculty workloads in CEES. Curriculum vitae for the CEES faculty can be found in Appendix B.

C. Faculty Size

The size of the CEES faculty is sufficient relative to the undergraduate enrollment. The total undergraduate student/faculty ratio has recently increased to 13:1; the ratio for the ArchE program is 11:1. Current undergraduate engineering enrollment is 265 with 51 in the ArchE program. The departmental goal was to reach a total undergraduate enrollment of 200 by year 2015.

In 2010, the lone senior faculty member in structural engineering resigned. This leaves CEES with three structural engineering faculty members. CEES has had to revise teaching schedules of faculty from environmental and geotechnical engineering to cover the basic mechanics courses (e.g., Statics and Dynamics, Mechanics of Materials) needed by structural engineers. This has allowed the remaining three structural engineering faculty to focus on upper division and a limited number of graduate courses in structural engineering. The funds remaining from the resigned position will be used to hire adjunct faculty to cover additional graduate courses through the Spring 2012 semester.

CEES faculty participate in numerous multidisciplinary research institutes across campus including the Water Technologies for Emerging Regions (WaTER), the Atmospheric Research Center (ARC), Center for Restoration of Ecosystems and Watersheds, Center for Analysis and Prediction of Storms, Institute for Applied Surfactant Research, Institute for Energy and the Environment, Oklahoma Transportation Center, and the Poromechanics Institute.
### Table 6-2. Faculty Workload Summary

Architectural Engineering

<table>
<thead>
<tr>
<th>Faculty Member (name)</th>
<th>PT or FT</th>
<th>Classes Taught (Course No./Credit Hrs.) Term and Year</th>
<th>Program Activity Distribution</th>
<th>% of Time Devoted to the Program</th>
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<tbody>
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<td></td>
<td></td>
<td>Teaching</td>
<td>Research or Scholarship</td>
<td>Other</td>
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<td>CEES 2313 – F10</td>
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<td>CEES 4114/5114 – F10</td>
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<td>ENGR 4510(3) – Sp11</td>
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<tr>
<td>Cerato, Amy</td>
<td>FT</td>
<td>CEES 3364 – F10</td>
<td>50</td>
<td>45</td>
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<td>Dresback, Kendra</td>
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<td>Fitzmorris, Clifford</td>
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<td>Hatami, Kianoosh</td>
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<td>CEES 2113 – F10</td>
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<td>Hong, Yang</td>
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<td>Courses</td>
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<tr>
<td>Kang, Thomas</td>
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<td>CEES 5020(3) – F10</td>
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CEES faculty also hold co-appointments or are adjunct faculty in the Mewbourne College of Earth and Energy, Chemical Biological and Materials Engineering, Chemistry and Biochemistry, Botany and Microbiology, and Zoology.

CEES faculty interact regularly with practicing professionals. The most notable example is the practitioner-directed multidisciplinary capstone courses. The instructors for these courses solicit real world projects from local practitioners. In addition, each capstone course has a Capstone Advisory Board made up of local practitioners well-versed in the subject area. Several CEES faculty regularly provide consulting services to local engineering firms. Also, three CEES faculty own private engineering firms. These firms occasionally hire graduates from CEES.

The Architectural Engineering Institute (AEI) student chapter has assisted CEES in the development of ArchE students capable of professional practice. Students are acquainted with team working skills and opportunities for networking with practicing engineers are provided.

D. Professional Development

CEES aggressively encourages faculty professional development. CEES encourages all faculty members to seek professional registration. A high percentage of CEES faculty members are registered Professional Engineers and have significant professional experience, which allows them to bring professional issues to the attention of the students through various forums. CEES faculty are also active in professional and technical societies. In addition, CEES faculty are encouraged to apply for sabbatical leaves every six years in order to maintain their research programs. Table 6-2 lists and assesses each member of the faculty based on their years of experience, professional registration and level of activities (e.g., professional, research and consulting).

E. Authority and Responsibility of Faculty

The CEES administrative structure is based upon the OU paradigm of a faculty administrative committee working in concert with the Director. The CEES Committee A consists of three faculty; one from each of the three thematic areas (i.e., environmental, geotechnical and structural). The Director serves as an Ex Officio member and functions as Chair of Committee A. Committee A members are nominated by the colleagues in their respective thematic areas and submitted to the entire CEES faculty for approval. Committee A members serve a two-year term.

As noted previously, governance of the ArchE program is based on feedback from the assessment processes. All of the information is shared with the CEES faculty through regular faculty meetings and the annual spring retreat. Most of the proposed substantive actions are derived from discussions at the annual retreat and are then directed to the appropriate committee. All substantive actions affecting the curriculum or faculty governance are voted on by the CEES faculty.
The general standing committee structure of CEES is functional. The charge to a committee is either obvious or suggested by the Director. For example, the Graduate Studies Committee is the control group for all graduate admissions and policies; the committee has representatives from each thematic area, plus a chair who serves for an extended period. Other CEES committees are: Undergraduate Curriculum; Undergraduate Scholarships; Program Outcomes Assessment; Technology and Software Review Committee; Laboratory Safety and Oversight committees for both the Fears Engineering Laboratory and the Broce Asphalt Laboratory. CEES faculty also serve as ASCE Student Chapter Advisor; Chi Epsilon Advisor; and Environmental Science Student Association Advisor. CEES faculty are also requested to serve on the following College of Engineering committees: Liaison to Student Advising; Academic Appeals and Misconduct; Library; and Dean’s Senior Faculty Advisory. CEES faculty also serve as Faculty Advisor to the student chapter of Engineers Without Borders, which is a college-wide organization.

CEES annual faculty evaluations are an important part of our assessment plan. CEES uses a peer evaluation process, which is designed to maximize faculty productivity by ensuring transparency of the evaluation process. Each January, faculty are required to prepare a 1-page mini-vitae and 2-pages of supplemental information documenting their accomplishments during the previous calendar year in teaching, research and creative activity, and service, along with a statement of their goals for the coming year. In support of preparation of these documents, the Director of CEES compiles and distributes data on:

1. Research expenditures
2. Research proposals submitted
3. Research proposals funded
4. Publication citations from the ISI Web of Science database
5. Composited course evaluation (i.e., teaching) scores
6. Student comments (anonymous) from the course evaluations

The composited course evaluation scores are derived from the evaluation form distributed in each course near the end of the semester (Attachment 10). CEES uses weighted responses for questions 3, 4 and 8 to develop Individual to Department (I/D) and Individual to College (I/C) ratios.

The Director of CEES shares all of the mini-vitae and supplemental information documents with each CEES faculty member. Each faculty member is requested to evaluate all other faculty members and the Director. These peer evaluations are composited and provided to Committee A (a three-member advisory committee to the Director). The Director and Committee A consider the peer evaluation scores and supporting documents in developing draft final evaluations scores. The draft evaluation scores are provided individually to each faculty member. Each faculty member is allowed an opportunity to meet with the Director and Committee A to discuss the evaluation scores. The Director and Committee A then forward the mini-vitae and the final annual evaluation scores to the Dean of the CoE. The Director also prepares an annual Unit Evaluation and submits that to the Dean of the CoE.
The College of Engineering Course Evaluation Form will be available for review during the campus visit unless otherwise requested.
CRITERION 7. FACILITIES

A. Offices, Classrooms and Laboratories

CEES is primarily housed in the Carson Engineering Center (CEC), although some faculty with co-appointments have offices in the Sarkey’s Energy Center and the National Weather Center. Classroom instruction is primarily conducted in one of four buildings: Carson Engineering Center, Devon Energy Hall, Felgar Hall and Sarkey’s Energy Center; however, classes with large sections (e.g., Mechanics of Materials) are often scheduled in larger classrooms across the campus.

The university provides classroom facilities for all lecture classes. The CoE has upgraded several classrooms with capabilities to support high levels of computer-interactive courses. Classroom facilities provided by the university are sufficient to support CEES lecture classes. New wireless classrooms can support the use of laptops in nearly all classrooms on the main campus.

Most CoE classes take place in CoE facilities. All of the general purpose CoE labs and several departmental labs also serve as computer classrooms. All CoE classrooms have wireless networking capability and most also have power and data connections available at each desk. CoE classrooms are outfitted with multimedia technology including data projectors, document cameras, VCR/DVD units, and connections for laptop display. Two CoE classrooms have high definition video conferencing capabilities, in addition to multimedia technology.

The CoE provides 32 team rooms that are outfitted with multimedia technology and available for student use. Nine of the rooms have a large plasma display with laptop audio and video connections. The three remaining rooms have data projectors plus dual plasma displays and laptop audio and video connections.

Students are also exposed to advanced instrumentation via various teaching laboratory experiences. The various facilities and equipment that students utilize during the undergraduate ArchE curriculum are discussed below.

1. CEES Study Laboratory (CEC S-20): This computer laboratory is used for the senior level CEES 4803-Professional Practice and CEES 4903- Civil Engineering Capstone courses. The laboratory has sixteen dedicated desktop computers, two printers, and laptop-friendly tables with power ports a printer, a black and white plotter and a color laser plotter. Half of the desktop computers are loaded with Autocad, in addition to traditional office software. This laboratory also helps expose students to industry standard and to the principles of engineering design, including team work, project management, design drawings and engineering practice.

2. Ray Broce Materials Laboratory (ENGR lab): This laboratory is used to teach
CEES 3404 - Materials, and CEES 3884 – Transportation Engineering. It has facilities for testing of aggregates used in making concrete and asphalt mixes, including a Gilson shaker for bulk sieving, a Los Angeles abrasion machine for durability testing, a set of full-height sieve for gradation analysis, apparatus for specific gravity testing, a vacuum saturation device for Rice specific gravity testing, and apparatus for measuring angularity. A humidity room is available for curing of concrete specimens under a controlled humidity. A servo-controlled MTS machine is available for testing of concrete cylinders and other materials under uniaxial compression loading or triaxial loading. Both static and cyclic loads can be applied using this device. Students use these facilities to evaluate design-related properties of concrete such as elastic properties, strength parameters, and failure behavior of concrete and other engineering materials discussed in CEES 3404. Students are also exposed to the engineering principles and mechanisms pertaining to the behavior of materials. The Ray Broce Materials Laboratory also has comprehensive facilities for testing of hot mix asphalt (HMA) in accordance with the AASHTO/ASTM guidelines. A Superpave gyratory compactor is available for preparing HMA samples. An asphalt vibratory compactor is available for making brick-type HMA samples. An APA rut machine is available to determine rutting and fatigue potential of HMA samples. Other facilities include an NCAT oven for burning of asphalt mixes, an environmental chamber for simulation of climatic conditions, a freeze-thaw cabinet, a hot water bath, a mixer, and ovens and balances. Students use these facilities to design flexible pavements as discussed in CEES 3884. Also, a graduate course, Asphalt Materials and Mix Design, use this laboratory extensively. ArchE seniors can take this class as a professional elective.

3. Soils Laboratories (CEC S-11): The soils laboratory is used for instruction in CEES 3364 - Soil Mechanics and CEES 5404 - Soil Stabilization. The laboratory includes equipment to measure consistency, permeability, gradation and compaction. Strength testing equipment consists of unconfined compression, motorized direct shear and one cylindrical triaxial device, and the lab contains three consolidometers for determining compressibility. The laboratory also houses a model to simulate seepage through earth dams. CEC S-11 is used for instruction in CEES 5423 - Environmental Geotechnology and CEES 5404 - Soil Stabilization. This room contains equipment for determining soil-water characteristic curves and permeability of unsaturated soils. It also houses an HP Vector Impedance meter for measuring electrical properties of soil. The use of soil laboratories helps prepare students for careers in architectural engineering that may involve laboratory measurements of soil properties.

4. Fears Structural Engineering Laboratory (South Campus): This lab is used for the following courses: CEES 3403 - Materials, CEES 3774 Concrete and Steel Design, CEES 4573 - Structural Design: Wood, CEES 5773 - Structural Design: Steel II, and CEES 5783 - Structural Design: Concrete II. The laboratory is equipped with static and dynamic loading systems including a 200,000 pound universal testing machine, and various hydraulic testing systems with capacities
ranging up to 300,000 pounds. These systems can be reconfigured using several large load frames that can be deployed over the large strong floor contained in the Fears Laboratory high bay. In addition, the lab contains a 4-ft by 6-ft shaker table and a 12-ft by 12-ft environmental chamber for materials research. The laboratory provides a venue where students can learn about the various materials used in structural design, and the fact that each course meets in the same area helps provide an understanding of the commonalities that exist in structural engineering that are independent of the particular material used in design. The use of Fears laboratory helps prepare students for careers in architectural engineering that may involve laboratory and field measurements of structural and foundation parameters. The facility also helps introduce students to the principles of engineering laboratory investigations, including the need to work as members of a team, the importance of proper experimental setup and the need to maintain accurate laboratory records, and the use of information technology to perform supporting data analysis/interpretation.

5. Engineering Practice Facility – The CoE recently completed construction of the world-class, one-of-a-kind ExxonMobil Lawrence G. Rawle Engineering Practice Facility (EPF), where current engineering students benefit from a real-world interdisciplinary experience. The two-story, 41,000-square-foot EPF includes 10,000 square feet that students can use to design and build engineering projects and senior capstone projects. There are five practice bays located on the first floor of the EPF. Four of these bays are high-bay works spaces open to the second floor; the fifth bay is one story, closed space separated from the rest of the facility by glass walls. The open bays have a hoist feature above them allowing for movement or display of large, heavy projects. The closed bay provides a work space for those projects that generate more dust and dirt, such as the concrete canoe. Each of the bays has large, bi-fold hangar doors opening to a green space. Projects can be rolled out and displayed on nice days. Students are able to take advantage of good weather and have a larger open space to work in.

B. Computing Resources

OU Information Technology operates seven computer labs for the benefit of all OU students. Additionally, the CoE provides three general purpose labs that are open to all CoE and College of Earth and Energy students. In total, engineering students have access to approximately 300 general purpose lab machines in addition to their departmental computer labs. All of these labs have workstation class Windows-based machines with access to general campus software, all engineering software, and program specific software. These computers are connected to high speed, networked copier-printers. The CoE also provides a high-end CAD lab with 9 machines available for graphic 3D rendering and processing. All of these labs are available to students 24 hours a day, 365 days a year.
In addition to the physical labs, the CoE makes a virtual lab environment available to students. This virtual lab has approximately 60% of the CoE-specific software installed and is available to students from on or off-campus 24 hours a day.

OU Information Technology and the CoE license the software that is used throughout the curriculum. This includes Ansys, AutoCAD, Bentley, Fluent, Gams, LabVIEW, Mastercam, MathCAD, MATLAB, Patran, ProII, SigmaPlot, Solidworks, Tecplot, and Visual Studio. This software is licensed for all lab computers. Additionally, some software is licensed for installation on faculty or student computers. Software installation and support is provided through the IT Service Center, which is available in various locations from 8am to 8pm, Monday through Friday. Official requests for new software purchases and installation can be made by faculty through the online software request form.

Faculty members are provided with the PC or Mac-based computer model of their choice and have access to centralized networked printers within their departments and personal network storage space.

The CoE has a mandatory laptop policy for students and provides recommended specifications for appropriate hardware. Many courses make use of the wireless network and software that is installed on student computers or through the virtual lab for in-class instruction.

CoE students are provided with additional computing resources as well. The CoE subscribes to the MSDNAA program which allows students to access most Microsoft software for installation and testing on their personal machines. The CoE provides personal network storage for each student which is available on or off-campus. Students also have access to free technical support for personal computer equipment, including general troubleshooting, installation of software, and hardware replacement.

The Technology and Software Review Committee (TSRC) Annual Report–The TSRC committee consists of three CEES faculty members. The TSRC is tasked with reviewing software and other tools used in all CEES courses to ensure that they meet state of the art/practice standards. In order to review the tools used in a course, the TSRC may follow a number of different approaches. These approaches include visiting in-class demonstrations, interviewing faculty members and students, and requesting a demonstration from a faculty member teaching a particular course. The TSRC prepares an annual report documenting its findings. These findings are documented in the annual ArchE Outcomes Assessment Report and reviewed with the faculty during annual evaluations and at the annual spring faculty retreat.

C. Guidance

All computing software used in ArchE courses is introduced to the student through classroom lectures, followed by guided laboratory sessions in which the instructor or an experienced Teaching Assistant (TA) is in attendance. Several courses have laboratory
sessions that involve use of tools and analytic instruments. These laboratory sessions start with a lecture on the proper use of the equipment, with an emphasis on safety. The lectures are conducted by the course instructor or an experienced TA. All instructional and research personnel dealing hazardous substances must undergo annual hazardous waste and safety training.

**D. Maintenance and Upgrading of Facilities**

Teaching and research laboratories, and the accompanying equipment, are vital components of an effective program for attracting and retaining students. Research and teaching laboratories are not funded through State budgets, and equipment must be acquired, replaced and maintained using either Salary Release Funds (SRF) or Sponsored Research Incentive (SRI) funds.

The chemical technician for CEES is Ron Conlon. Mr. Conlon maintains and services equipment for environmental and geotechnical laboratories in the CEC.

The other departmental technician (Mike Schmitz) is assigned to the Fears Structural Engineering and Broce Materials laboratories. Mr. Schmitz maintains all testing equipment at these facilities and assists in construction of various teaching and/or research devices. Mr. Schmitz also provides mechanical maintenance and repair services for CEES on an as-needed basis.

The costs of maintenance and servicing are covered by a number of sources. Routine course fees are used to purchase equipment and supplies required to teach courses. Research grant funds are used to cover routine maintenance and servicing requirements and to purchase maintenance agreements for equipment that is vulnerable to large maintenance and servicing costs. As needed, faculty use SRF and SRI funds to maintain and service equipment required for research activities.

**E. Library Services**

The University of Oklahoma Libraries serves the research needs of the CoE through the Engineering Library. The branch library, located in Felgar Hall in the heart of OU’s engineering complex, provides convenient access to library materials and space for both collaborative and private study. The collection houses over 80,000 circulating volumes and a large selection of reference, periodical, and reserve materials. The branch library has seating for more than 50 students and offers seven computer workstations.

In addition to the traditional print collections, the University Libraries has made full text electronic access to scholarly monograph and journal content a top priority in its collection development endeavors. The University Libraries website features an Engineering subject page that provides e-access to a wide array of scholarly content from key science and technology publishers, including Elsevier, Springer, IEEE, ASCE, ICE, Wiley, CRC, and ASTM. University Libraries has aggressively pursued digital collections, including standards, proceedings, journals, and e-books, from these and many
other engineering and applied sciences publishers and e-book aggregators. Content discovery is supported by more than a dozen science and engineering databases, including Engineering Information Village, IEEE Xplore, and Web of Science. Content access, print and electronic, is supported by the University Libraries’ online catalog. While the Engineering Librarian promotes the use of the University Libraries’ free interlibrary loan service to access materials outside of the collection, the librarian is responsive to new purchase requests and actively encourages purchase recommendations and collection input from the teaching faculty.

The Engineering Library is staffed by a tenure-track librarian, a full-time library technician, and six part-time student library assistants. The Engineering Librarian provides both in-class research instruction and individual research consultation. All Engineering Library staff are available for on-site reference assistance during operating hours, currently 69 hours per week during the fall and spring semesters and 53 hours per week through the summer session.

F. Overall Comments on Facilities

The university manages the classroom facilities. The Provost has an advisory committee for classrooms (PACCR). The committee reviews all aspects of the classroom facilities on campus, prioritizes renovations and sets standards for the rooms. The School in which a particular program resides manages the laboratory facilities.

All CEES laboratories follow the OU safety guidelines found at:

http://www.ouhsc.edu/ehso/Normanlabman/NormanLaboratorySafetyManual.htm

Each building has an emergency response plan covering all schools and programs housed in the facility. These plans establish a foundation for emergency response within and recognize that emergency planning and emergency response is a continual process that will adapt to the nature of the emergency at hand. They also serve as a framework to respond effectively and safely to an emergency. Each plan includes assessing an emergency situation, coordinating a response effort and, most importantly, that individuals are informed, safely evacuated or sheltered and accounted for with reasonable accuracy. The plans establish seamless migration with the University of Oklahoma Emergency Response Plan. The University’s Emergency Response Plan is located at: www.ou.edu/admin_and_finance.html.

The EPF is the home for all undergraduate students in the CoE and Mewbourne School of Petroleum and Geological Engineering (MPGE) students in the College of Earth and Energy. The facility has three major thrust areas: Hands-on multidisciplinary projects, student leadership, and engineering outreach. The 1st annual EPF Leadership Teams Workshop was held last September to introduce student leaders in the CoE to staff and resources in the EPF, as well as review proper emergency and safety procedures when using the facility, practice bays and machine shop. Students had an opportunity for team-building to build a more cohesive unit between student organizations and competitions.
using this facility, as well as learning about the unique experiential learning that occurs, ways students in the building contribute to K-12 outreach and recruitment, as well as tools to help each organization be successful throughout the year.

To ensure safety in the facility, there is a comprehensive safety manual covering safety procedures and operations in the building. The manual details the procedure for briefing, training, and monitoring the users of the facility. Upon arrival in the facility, new users are introduced to the manual and thoroughly briefed on the contents. They are given specific direction on important safety procedures like the use of personal safety equipment (impact resistant eyewear, hearing protection, etc.) as well as the location of other safety equipment like eyewash stations, fire extinguishers, etc. A description of emergency procedures like fire evacuation inclement weather procedures is given as well. After receiving the safety briefing the users are given one-on-one training for each individual machine in the machine shop, dyno-testing room, bench labs, and bays. The students are not allowed to operate equipment until they have demonstrated to a staff member that they are competent and aware of all safety aspects involving that particular machine. At that time they are allowed to begin working on their own with the constant supervision of properly trained and designated student safety officers and student employees. In addition, throughout the course of each semester, there are workshops given on techniques and practices on each machine type or manufacturing process, such as welding and composite part manufacturing.
CRITERION 8. INSTITUTIONAL SUPPORT

A. Leadership

The CEES administrative structure is based upon the OU paradigm of a faculty administrative committee working in concert with the Director. The CEES Committee A consists of three faculty; one from each of the three thematic areas (i.e., environmental, geotechnical and structural). The Director serves as an Ex Officio member and functions as Chair of Committee A. Committee A members are nominated by the colleagues in their respective thematic areas and submitted to the entire CEES faculty for approval. Committee A members serve a two-year term.

B. Program Budget and Financial Support

Budget Process

CEES is allocated an annual State maintenance and operations (M&O) budget and funds to cover a limited number of teaching assistantships (TA’s). Both the M&O budget and the graduate TA fund are grossly underfunded and continue to be augmented by SRI funds. Using research-generated funding to meet day-to-day expenses provides a strong disincentive for obtaining external research funds. Note that only 35% of annual M&O funding comes from State appropriations; the majority of expenditures must be raised by the unit.

SRI funds are derived from indirect costs on research grants. The Vice President for Research Administration establishes the indirect cost funds that are available for return to the colleges. Typically, about twenty percent of the available funds are returned to the colleges, prorated based on the level of indirect costs generated. The CoE Dean’s office keeps 1.67% of the SRI funds and returns the remainder to the generating School. CEES SRI funds are divided between the PI (65%) and CEES (35%). CEES uses captured SRI funds for TAs and additional M&O expenditures.

The Provost also provides funds each year to support Assessment Activities. CEES uses the assessment funds to cover the cost for each student’s initial attempt at passing the FE examination.

Externally funded contract research typically contains some funds to pay faculty time during the academic year. All faculty positions are funded at 100% by the State (for each FTE). Therefore, a faculty member having external funding may appoint him/herself to a project or grant for pay. The funds from the project release an equal amount of funds from the State appropriation for that particular faculty position. These are called salary release funds (SRF). All of the released State funds are retained by the School generating the external research funds. CEES currently returns all SRF funds to the PI.
In FY11, CEES had an annual State budget allotment of approximately 14 TAs (where 1 TA is a work commitment of 20 hours per week for 1 semester). Typically, an equal number of State-supported TAs are assigned in the fall and spring semesters. Preference for TAs is given to: courses with laboratory components; new faculty, faculty with extraordinary and compelling requirements; lower division classes with enrollments over 30, upper division classes with over 20 students, and graduate classes with more than 10 students. For classes, other than those described above, faculty are expected to fund their own TA requirements using returned SRF/SRI funds.

Faculty salaries continue to be low when contrasted with comparator institutions. The discrepancy in salary levels is particularly evident for newly promoted Professors. This is of particular concern because this group includes six of the seven NSF CAREER awardees. Other universities could try to lure away these talented individuals unless the University can provide them with competitive salaries.

C. Staffing

CEES has four administrative staff personnel including the Assistant to the Director (Ms. Audre Carter), Graduate Programs Assistant (Ms. Susan Williams), Accounting Specialist (Ms. Brenda Clouse), and Staff Assistant (Ms. Molly Smith). The staff is adequate for running the day to day operations of the CEES graduate and undergraduate programs. To date, CEES has used part time staff to handle administrative overloads such as the WaTER Conference. However, additional full time staff personnel will be needed as CEES pursues new initiatives such as the WaTER Center.

The chemical technician for CEES is Ron Conlon. The other departmental technician (Mike Schmitz) is assigned to the Fears Structural Engineering and Broce Materials laboratories.

CEES allows staff personnel to attend mandatory training (e.g., sexual harassment, hazardous materials) and career advancement workshops available during regular business hours. Attending these types of events is considered part of the regular workload.

CEES has been fortunate to retain the administrative and technical staff over the past six years. The poor economic conditions of the state of Oklahoma have not allowed for raises for the past three years. Limited discretionary funds were used to give meager annual bonuses to the staff this past year.

D. Faculty Hiring and Retention

CEES uses a rigorous screening process for filling faculty vacancies. When a position becomes available, a Search Committee is formed. The Search Committee is comprised of at least two faculty members from the impacted thematic area (structural, geotechnical or environmental) plus one representative from each of the two remaining areas. The Director also serves on all Search Committees. The Search Committee is charged with
developing a position description for the vacancy. The committee submits the position
description for faculty approval, then university approval and then distributes it to the
appropriate advertising outlets (e.g., Department Heads Council, ASCE magazine, etc.).
The Search Committee conducts the initial screening of the applicant pool then applies
for approval from the university’s affirmative action office. Once the screened pool is
approved, the Search Committee conducts telephone interviews with each approved
candidate. The candidates are supplied a list of questions and they return typewritten
responses to the Search Committee prior to the telephone interview. After all of the
telephone interviews are completed, the Search Committee meets to narrow down the
pool to at most 3 candidates to bring to campus for personal interviews with the entire
CEES faculty and other university administrators. The entire CEES faculty then meets to
decide on which, if any, of the candidates to make an offer.

CEES has been fortunate to retain its talented faculty members over the past six years. In
2005, President Boren was instrumental in securing funds from the OU Foundation to
address salary compression for our talented Associate Professors. However, the poor
economic conditions of the state of Oklahoma have not allowed for raises for the past
three years.

The primary means for retaining talented faculty in lieu of pay increases is award
nominations. As noted previously, CEES faculty have been nominated and selected for
every conceivable teaching and research award that the university offers. The Director
and Committee A make a concerted effort to develop award nominations for deserving
CEES faculty every year. In addition, when CEES faculty receive national awards (e.g.,
PECASE, AEESP Outstanding Faculty), the Director has negotiated pay raises and other
professional development resources (e.g., laboratory renovation funds) from the central
administration.

**E. Support of Faculty Professional Development**

Faculty professional development is covered in Section 6.D
PROGRAM CRITERIA

As noted in Table 5-1 the undergraduate curriculum meets the basic level requirements for mathematics and basic sciences. The undergraduate ArchE curriculum requires coursework from: history of architectural design (history of architecture – 3 credits), architecture (architectural studio – 8 credits), structural engineering (analysis – 9 credits and design – 7 credits), civil engineering (civil engineering measurements – 4 credits, geotechnical engineering – 4 credits analysis and 3 credits design, and materials – 3 credits), and building mechanical (6 credits analysis, 3 credits design) and electrical (4 credits analysis, 3 credits design) systems, plus the two semester capstone sequence.

Laboratory sections are required for select courses including: Architecture (Studio I and II); Geotechnical Engineering (CEES 3364 - Soil Mechanics); and Structures (CEES 3774 Concrete and Steel Design). The two general civil engineering courses (CEES 3403 - Materials and CEES 3334 - Measurements) and a number of professional electives in each area also include laboratory experiences.

The ArchE program includes several mechanical engineering courses (AME 2213, 3173, 4653) regarding building mechanical systems. Basic concepts in plumbing system design are covered in the fluid mechanics class (CEES 2223) and plumbing system design is required as part of each ArchE capstone (CEES 4993) project. Electrical systems are covered in PHYS 2524, ENGR 2431 and CEES 4113. The Building Lighting and Electrical Systems course is listed as CEES 4113, but is taught by an adjunct faculty member from electrical engineering. The structural engineering component of the ArchE program includes analysis (CEES 2113, 2153, 3253, 3414) and design (CEES 3774, 4753) courses. The ArchE program also includes a foundations engineering course (CEES 4333) that is important to structural engineering.

Design concepts, methodology and teamwork are incorporated throughout the ArchE curriculum, beginning with the first year (CEES 1112 Introduction to CEES). The curriculum culminates in a two semester major capstone experience (CEES 4803 and CEES 4993). The Professional Practice (CEES 4803) course addresses professional, ethical and management issues. The ArchE Capstone (CE 4993) course addresses a practitioner-guided, real world “building” design problem using multidisciplinary teams comprised of civil and architectural engineers. The ArchE students are charged with developing the structural and building mechanical and electrical systems designs for the structure such that it meets the requirements for LEED certification. Prior to enrolling in CEES 4993, students must have completed five prerequisite courses – CEES 3364 Soil Mechanics, CEES 3774 Concrete/Steel Design, AME 4653 Air Conditioning Design, CEES 4113 Lighting and Electrical System Design, plus CEES 4803 Professional Practice course. These prerequisites ensure that students in the capstone course have been exposed to design processes necessary for completing the project.
Appendix A – Course Syllabi
Note: All courses in Appendix A are required courses.

1. Course Number and Name:
   AME 2213 – THERMODYNAMICS

2. Credits and Contact Hours:
   3 Credit Hours, 3 hour lecture

3. Instructor’s or Course Coordinator’s Name:
   F. C. Lai
   C. Dalton

4. Text Book, Title, Author, and Year:

5. Specific Course Information:
   a. Catalog Description:
      First and second law of thermodynamics are developed and applied to the solutions of problems from a variety of engineering fields. Extensive use is made of differential calculus to interrelate thermodynamics functions.

   b. Prerequisites and/or Co-requisites:
      MATH 2433 – Calculus III
      PHYS 2524 – Physics II

6. Specific Goals for the Course:
   a. Specific Outcomes of Instruction:
      This course relates to: 1A, 1B, 1C, 2B, 3B, 4A

   b. Student Outcomes:
      EAC Outcomes: a, c, k

7. Brief List of Topics Covered:
   a. Thermodynamic Properties
   b. Energy, Work, and Heat
   c. First Law - Energy Analysis for Closed Systems
   d. First Law - Energy Analysis for a Control Volume
   e. Second Law
   f. Entropy
   g. Vapor Power Systems
   h. Gas Power Systems
1. **Course Number and Name:**
   AME 3173 Heat Transfer

2. **Credits and Contact Hours:**
   3 Credit Hour, 3 hour lecture

3. **Instructor’s or Course Coordinator’s Name:**
   Takumi Hawa and Wilson Merchan-Merchan

4. **Text Book, Title, Author, and Year:**
   
   a. **Reference:**

5. **Specific Course Information:**
   
   a. **Catalog Description:**
   Heat transfer by conduction, convection, and radiation; mass transfer and combined modes of heat transfer. (Sp)

   b. **Prerequisites and/or Co-requisites:**
   Prerequisite: 2213 or Engineering 2213, 3153
   Required

6. **Specific Goals for the Course:**
   
   a. **Specific Outcomes of Instruction:**
   At the end of the semester the students will:
   
   i. Be able to derive and apply the heat conduction equation in various coordinate systems. Understand multidimentional heat transfer.

   ii. Be able to reduce or modify the heat equation for steady state and transient heat conduction.

   iii. Understand the thermal resistance networks to solve heat conduction problems. Be able to solve heat transfer problems using resistance networks in objects that involve multilayer rectangular, cylindrical, and spherical geometries.

   iv. Appreciate thermal resistance networks over the heat equation and compare its limitations.

   v. Be able to derive and apply the heat equation for finned surfaces in multi geometries. Appreciate that the simple addition of fins can efficiently and effectively enhance heat transfer in a system.

   vi. Be able to apply analytic solutions (exact or one-term approximation) for transient one-dimensional conduction problems in rectangular, cylindrical, and spherical geometries. Be able to apply and appreciate the Heisler charts to solve transient heat transfer problems.
vii. Understand the concept and the limitations of the Lumped Capacity Method.
viii. Be able to solve one- or two-dimensional (steady and transient) heat conduction problems using finite difference method. Appreciate Numerical methods over analytical methods in heat conduction.
ix. Understand the fundamentals of convection by becoming familiar with the differential equations that govern convection on the basis of mass, momentum, and energy balances. Be able to analyze hydrodynamic and thermal boundary layer thickness. Calculate drag force and sheer. Be able to obtain the heat transfer coefficient. Obtain working knowledge of dimensionless numbers to characterize fluid properties.
x. Be able to analyze problems dealing with internal forced convection.
xi. Be able to analyze problems dealing natural and a combination of natural and forced convection. Be able to appreciate the importance of each mode and identify when one mode becomes dominant over the other.
xii. Classify electromagnetic radiation and identify thermal radiation.
xiii. Understand the idealized black body and calculate the total and spectral black body emissive power.
xiv. Understand the concept of radiation intensity.
xv. Develop a clear understanding of the properties of emissivity, absorptivity, reflectivity, and transmissivity on spectral and total basis.
xvi. Apply Kirchhoff’s laws to determine the absorptivity of a surface.
xvii. Develop view factor relations and calculate the unknown view factors in an enclosure.
xviii. Determine radiation heat transfer between diffuse and gray surfaces.

b. Student Outcomes:

Aerospace Engineering Program Outcomes: a,e,k

a: an ability to apply knowledge of mathematics, science, and engineering
e: an ability to identify, formulate, and solve engineering problems
k: an ability to use techniques, skills, and modern engineering tools necessary for mechanical engineering practice

7. Brief List of Topics Covered:

a. The first law of thermodynamics
b. Heat conduction equation
c. Thermal contact resistance and fins
d. Transient heat conduction
e. Numerical methods in heat conduction
f. Velocity and thermal boundary layer
g. External and internal forced convection
h. Natural convection
i. Radiation heat transfer
j. Blackbody radiation
k. Radiation intensity
1. **Course Number and Name:**
   AME G4653, Air-Conditioning Systems

2. **Credits and Contact Hours:**
   3 Credit Hour, 3 hour lecture

3. **Instructor’s or Course Coordinator’s Name:**
   Li Song

4. **Text Book, Title, Author, and Year:**

5. **Specific Course Information:**
   a. **Catalog Description:**
      "Theory and design systems for controlling properties such as temperature, humidity, air purity, air distribution and noise in enclosures. (Irreg.)"
   b. **Prerequisites and/or Co-requisites:**
      Prerequisite: 3173, heat transfer.

6. **Specific Goals for the Course:**
   a. **Specific Outcomes of Instruction:**
      At the end of the semester the students will:
      i. Understand the moisture air property and processes.
      ii. Understand the indoor environmental quality requirement.
      iii. Gain the knowledge to estimate space heating and cooling loads.
      iv. Be able to design air handling unit systems for buildings for temperature, humidity and air purity control.
   b. **Student outcomes:**
      EAC Outcomes: a,c,e,g

7. **Brief List of Topics Covered:**
   1) **Introduction (week 1)**
      - Introduction to HVAC
   2) **HVAC fundamentals (Week 1-8)**
      - System properties and first law of thermodynamics
      - Moist Air and Fundamental Parameters
      - Psychrometric chart
      - Indoor environmental quality
      - Building load calculations
      - Solar radiation
      - Space load analysis
3) **Air handling unit system (Week 9-11)**
   - Overview of AHU configuration
   - Cooling coil load
   - Air handling unit control
   - Overview of different types of Air handling units for commercial buildings

4) **Design of Air Distribution System (Week 12-14)**
   - Diffuser and terminal box
   - Fluid flow basics and Duct design
   - Fan selection and Cooling coil selection

5) **Advance topic (15-16): Onsite measurements: building load measurements and air handling unit energy consumption measurements**
1. **Course Number and Name:**
   Arch 1154 Studio I

2. **Credits and Contact Hours:**
   4 hours – Studio

3. **Instructor’s or Course Coordinator’s Name:**
   Thomas Cline

4. **Text Book, Title, Author, and Year:**
   Various Handout Materials

5. **Specific Course Information:**
   a. **Catalog Description:**
      Individual and/or team architectural projects at an introductory level focused on the comprehensive integration of social, cultural, theoretical, environmental, and technical influences on architecture. Application of professional techniques of representation and communication required.
   b. **Prerequisites and/or Co-requisites:**
      None

6. **Specific Goals for the Course:**
   a. **Theoretical Objectives**
      Introductory level focused on the comprehensive integration of social, cultural, theoretical, environmental, and technical influences on built environments
      Idea of craft as it relates to the manipulation of and interactions among discrete 2D and 3D components
      Exploration of the ideas and methods of design
   b. **Skill objective**
      Application of professional techniques of representation including graphic conventions verbal communication
      Awareness of issues necessary for development of Critical thinking
      Communication skills (verbal, written, and graphic)
      Sketching/Journaling
      Gathering information relative to projects
      Architectural vocabulary
   c. **Demonstrated Outcomes (evidence)**
      Sketches
      Models
      Drawings
      Verbal presentations
      Journal entries
      Awareness of craft, precision, etc.
d. **Pedagogical Methods**
   - Project descriptions and programs
   - Desk reviews
   - Class discussions/presentations
   - Demonstrated techniques
   - Comprehensive critiques

e. **Project Typologies and Scale**
   - Sketches
   - Object representation
   - Abstraction/manipulations/transformations
   - Drawing
   - Drafting
1. Course Number and Name:
   Arch 1254 Studio II

2. Credits and Contact Hours:
   4 hours – Studio

3. Instructor’s or Course Coordinator’s Name:
   Thomas Cline

4. Text Book, Title, Author, and Year:
   Various Handout Materials

5. Specific Course Information:
   a. Catalog Description:
      Students are introduced to the basic principles and concepts for design professionals. Topics include cultural, social, theoretical and behavioral factors and their implications for planning and designing the built environment. Application of professional techniques of representation and communication are required.
   b. Prerequisites and/or Co-requisites:
      Prerequisite: 1154 with a grade of C or better.

6. Specific Goals for the Course:
   a. Theoretical Objectives
      Comprehensive integration of social, cultural, theoretical, environmental, and technical influences on design
      Application of professional techniques of representation and communication required
      integrate fundamentals of design and design representation into an understanding of the tectonics of architectural form/space
      expand your design vocabularies
      ability to verbally communicate design intentions
      ability to view architecture as a complex system of design that must rely upon multiple variables in order to reach appropriate solutions
      explore architecture in relation to:
         history
         precedents
         site
         materials
         technology
         culture
      apply the fundamentals of design, influenced by a current focus on research and analysis, to investigate formal and spatial relationships that illustrate an understanding of design as a complex system that is fully dependent upon particular context
   b. Skill objective
sketching
mechanical drafting
create well crafted models and presentations
Research documentation
c. **Demonstrated Outcomes (evidence)**
   Pedagogical Methods
   Research
d. **Project Typologies and Scale**
   Group/Multi disciplinary experiences
   Sustainability
   Community action
1. **Course Number and Name:**
   ARCH 2243 – History of the Built Environment I

2. **Credits and Contact Hours:**
   3 hours – Lecture

3. **Instructor’s or Course Coordinator’s Name:**
   Catherine Barrett

4. **Text Book, Title, Author, and Year:**
   Architecture from Prehistory to Postmodernity, Trachtenberg/Hymen

5. **Specific Course Information:**
   a. **Catalog Description:**
      Overview of built artifacts in Europe and the Americas since 1750. Emphasis on the formal, philosophical, social, technical and economic context of the projects discussed, as well as their later reinterpretations.
   b. **Prerequisites and/or Co-requisites:**
      Prerequisite: majors only or permission of instructor

6. **Specific Goals for the Course:**
   a. **Theoretical Objectives**
      The course objective is to expose students to our architectural past through the events, cultures, arts, and constructs of the world’s known civilizations. Study of the economic, technological, and cross-cultural effects of war, trade, and colonialism will introduce the influences that result in notable architecture. Historical traditions and the diverse global cultures that produced them will be addressed. The sources and interrelation of engineering, architecture, landscape, planning, and construction are guiding principles of the course content.
   b. **Student Outcomes:**
      Four research based position papers
      Demonstrations of writing and critical thinking
      Critical thinking/ writing
      Working vocabulary of significant built artifacts over time

7. **Brief List of Topics Covered:**
   Overview of Course, Historical Context and World Cultures
   Paleolithic, Neolithic and Early Settlements
   Near East, Persia, Minoan
   Early Greece, Orders
   Late Greek Architecture
   Rome, Etruscan, Religious Buildings
   Rome, Civic Buildings
   Early Christian, Byzantine
   Byzantine Eastern Orthodox
Islam, Indo Islamic
Pre-Romanesque, Romanesque
Late Romanesque
Gothic France
Gothic England, Northern Europe
Fortifications, Pre Renaissance
1. **Course Number and Name:**
   CEES 1000, Civil Engineering and Environmental Science Seminar

2. **Credits and Contact Hours:**
   0 Credit Hours, One 60-minute lecture every two weeks

3. **Instructor’s or Course Coordinator’s Name:**
   Randall Kolar

4. **Text Book, Title, Author, and Year:**
   None
   
   a. **Other Supplemental Materials:**
      None

5. **Specific Course Information:**
   
   a. **Catalog Description:**
      Seminar provides a common meeting time for students and faculty for department activities, such as invited speakers, project presentations, educational surveys, cross-course project coordination, and policy announcements. Students must enroll every semester that they are matriculated in CEES at OU after the freshman year, but in no case can a student graduate without successfully completing four semesters of seminar. (F, Sp)

   b. **Prerequisites and/or Co-requisites:**
      None

6. **Specific Goals for the Course:**
   
   a. **Specific Outcomes of Instruction:**
      Further the students’ educational and professional development via external speakers representing various fields of CEES practice, movies followed by discussion, and student/faculty dialogue.

   b. **Student Outcomes:**
      EAC Outcomes: f, h, i, j

7. **Brief List of Topics Covered:**
   
   a. Example seminar topics from the past two semesters include the following: water resources in developing countries; offshore renewable energy; engineering ethics; earth retaining structures; NGWA Darcy lecture on groundwater/surface water interactions; CEES and ABET; a day in the life of a consulting engineer; Oklahoma’s comprehensive water plan; Graduate school opportunities.
1. **Course Number and Name:**
   CEES 1112, Introduction to Civil Engineering and Environmental Science

2. **Credits and Contact Hours:**
   2 Credit Hours, Two 75-minute lectures per week

3. **Instructor’s or Course Coordinator’s Name:**
   David A. Sabatini

4. **Text Book, Title, Author, and Year:**
   None
   a. **Other Supplemental Materials:**
      None

5. **Specific Course Information:**
   a. **Catalog Description:**
      Prerequisite: Freshman only. Introduction to fundamental concepts (mass/flow balance), problem solving and design, and simple computing software for architectural, civil or environmental engineers and environmental scientists. (F)
   b. **Prerequisites and/or Co-requisites:**
      Prerequisite: Freshmen only. Required.

6. **Specific Goals for the Course:**
   To gain fundamental skills critical to being a successful civil / environmental engineer / scientist, as listed below:
   a. **Specific Outcomes of Instruction:**
      At the end of the semester the students will:
      i. Have a basic understanding of civil engineering, environmental engineering, and environmental science issues.
      ii. Be able to tackle a complex problem by breaking it down into its components and developing solution pathways.
      iii. Be able to use basic methods (e.g., conservation of mass) and basic tools (e.g., Excel) to analyze components of a complex problem.
      iv. Effectively work in teams and communicate results in oral and written form using common tools (e.g., Word, PowerPoint).
      v. Improve skills as a self-guided learner.
   b. **Student Outcomes:**
      EAC Outcomes: a, c, i, k

7. **Brief List of Topics Covered:**
   a. Engineering calculations
   b. Mass and flow balance
   c. Spreadsheets
   d. Hydrological processes
   e. Presentations with PowerPoint
   f. Design of a dam
   g. Engineering economics
   h. Group dynamics
1. **Course Number and Name:**
   CEES 1213 Computing Applications in Civil Engineering and Environmental Science

2. **Credits and Contact Hours:**
   3 Credit Hours, Two 75-minute lectures per week

3. **Instructor’s Name:**
   Tohren C. G. Kibbey

4. **Text Book, Title, Author, and Year:**
   “AutoCAD 2010 Essentials”, Hamad, 2009
   a. **Other Supplemental Materials:**

5. **Specific Course Information:**
   a. **Catalog Description:**
      Introduction to application software and computing tools relevant to civil engineering, environmental engineering and environmental science, including programming, spreadsheets and computer-aided design. (F)
   b. **Prerequisites and/or Co-requisites:**
      Prerequisite: Math 2423, Physics 2514 or concurrent enrollment

6. **Specific Goals for the Course**
   a. The objective of this class is to introduce a diverse set of computational skills that will help students, both in their studies, and as practicing civil or environmental engineers or environmental scientists. The course emphasizes programming, advanced spreadsheet use, and computer aided design.
   b. **Student Outcomes:**
      EAC Outcomes: k

7. **Brief List of Topics Covered:**
   A. **Programming with C++**
      a. Introduction to C++
      b. Basic Elements of C++
      c. The structure of a C++ program
      d. Input and output
      e. Branches
      f. Loops
      g. Arrays
      h. Strings
      i. Functions
j. Objects and Object Oriented Programming

B. Spreadsheets
   a. Introduction to Excel
   b. Entering and working with formulas
   c. Relative vs. absolute references
   d. Formatting spreadsheets
   e. Good spreadsheet practice
   f. Built-in Functions
   g. Plotting (Charts)

C. Scientific/Engineering Graphics with AutoCAD
   a. Scientific/Engineering Graphics Basics
   b. AutoCAD Basics
   c. Layers
   d. Dimensioning
   e. Model Space vs. Paper Space
1. **Course Number and Name:**
   CEES 2113, Statics and Dynamics

2. **Credits and Contact Hours:**
   3 Credit Hours, Three 50-minute lectures per week

3. **Instructor’s or Course Coordinator’s Name:**
   Jin-Song Pei (Jinsong Pei)

4. **Text Book, Title, Author, and Year:**
   a. **Other Supplemental Materials:**
      None

5. **Specific Course Information:**
   a. **Catalog Description:**
      Vector representations of forces and moments; general three-dimensional theorems of statics and dynamics; centroids and moments of area and inertia. Free-body diagrams, equilibrium of a particle and of rigid bodies, principles of work and energy; principle of impulse-momentum. Motion of particles and rigid bodies in translating and rotating reference frames. Newton’s law of motion and Lagrange’s equation, including application to lumped-parameter systems. Analyses of trusses, frames and machines. (F, Sp)
   b. **Prerequisites and/or Co-requisites:**
      Prerequisite: Physics 2514 and Mathematics 2433 or concurrent enrollment in Mathematics 2433.
      Required

6. **Specific Goals for the Course:**
   a. **Specific Outcomes of Instruction:**
      At the end of the semester the students will have a solid grasp of all topics covered in this course that are listed under Item 7.
   b. **Student Outcomes:**
      EAC Outcomes: a, e
      a. an ability to apply knowledge of mathematics, science and engineering
      e. an ability to identify, formulate and solve engineering problems

7. **Brief List of Topics Covered:**
   a. Force resultants and resolution of forces into components
   b. Rectangular components of a force, Unit vectors, Addition of forces
   c. Equilibrium of a particle, Free-body diagrams
   d. Rectangular components of a force in space, Equilibrium of a particle in space
   e. Vector product of two vectors, Moment of a force about a point
   f. Scalar product of two vectors, Mixed product of vectors
g. Moment of a force about a given axis, Moment of a couple
h. Equivalent systems of forces
i. Equilibrium of rigid bodies in two dimensions
j. Equilibrium of rigid bodies in three dimensions
k. Centroids and centers of gravity, distributed loads on beams
l. Analysis of trusses by the method of joints and sections
m. Introduction to analysis of beams
1. **Course Number and Name:**
   CEES 2153, Mechanics of Materials (Regular and Honors Sections)

2. **Credits and Contact Hours:**
   3 Credit Hours, Two 75-minute lectures or Three 50-minute lectures per week

3. **Instructor’s or Course Coordinator’s Name:**
   Kianoosh Hatami

4. **Text Book, Title, Author, and Year:**

   a. **Other Supplemental Materials:**
      a. Lecture notes in PowerPoint
      b. Links to selected interesting and informative websites posted on D2L (e.g. textbook website (learning center); http://www.engineeringsights.org/; http://video.pbs.org/video/1701025927/; http://web.mst.edu/~medialab/fipse/preview/Philpot/mohr_stress/a_draw.htm)

5. **Specific Course Information:**
   a. **Catalog Description:**
      Basic principles of mechanics, including the definition of stress and strain, transformations and principal values for the stress and strain tensors, kinematic relations, review of conservation equations and the development and application of constitutive laws for idealized materials. Elementary elastostatics utilizing Hooke’s law; constitutive relations for a linear-elastic continuum, including elastic parameters such as Young’s modulus, shear and bulk moduli and Poisson’s ratio. Solution of elementary one- and two-dimensional mechanics problems, including thermal stresses and strains, beam flexure, shear and deflections, pressure vessels and buckling of columns. (Sp)

   b. **Prerequisites and/or Co-requisites:**
      Prerequisite: CEES 2113 or Aerospace and Mechanical Engineering 2113 or Petroleum Engineering 2113.
      Required

6. **Specific Goals for the Course:**
   a. **Specific Outcomes of Instruction:**
      At the end of the semester the students will understand analysis and design of members subjected to axial, shear, torsion and bending stresses. They will develop an understanding of basic concepts such as stress, strain, material strength and elastic properties, and plane-strain and plane-stress problems. They will be able to determine principal stresses in a beam under combined loading using Mohr’s Circle. Additionally, they will be able to solve relatively simple
problems related to the analysis and design of pressure vessels and deflection of beams.

b. Student Outcomes:
EAC Outcomes for this course include: a,d,e,f

7. Brief List of Topics Covered:
   a. Review of statics
   b. Concepts of stress and strain
   c. Hooke's Law and linear elasticity
   d. Modulus of elasticity
   e. Stress, strain and deflection of axially loaded members
   f. Shear stress and strain
   g. Shear modulus
   h. Torsional stress and strain
   i. Pure shear
   j. Torsional deformations
   k. Power transmission in circular shafts
   l. Beams
   m. Shear and bending moments diagrams
   n. Bending stresses and strains in beams
   o. Composite beams
   p. Shear stresses in beams
   q. Transformation of plane stress
   r. Principal stresses and strains
   s. Mohr's circle
   t. Pressure vessels
   u. Deflection of beams
   v. Beam deflections by integration
   w. Moment-area theorems
   x. Statically indeterminate structures
1. **Course Number and Name:**
   CEES 2223, Fluid Mechanics

2. **Credits and Contact Hours:**
   3 Credit Hours, Two 75-minute lectures per week

3. **Instructor’s or Course Coordinator’s Name:**
   Randall Kolar, Keith Strevett (two sections taught)

4. **Text Book, Title, Author, and Year:**
   a. **Other Supplemental Materials:**
      None

5. **Specific Course Information:**
   a. **Catalog Description:**
      Coverage of the fundamentals of fluid statics and dynamics. Formulation of the equations of fluid flow, i.e., Navier-Stokes equation, Eulers equation, Bernoulli equation, etc. and their application. Examples of ideal fluid flow and viscous fluid flow, such as flow in open and closed conduits. (Sp)

   b. **Prerequisites and/or Co-requisites:**
      Prerequisite: 2113 or Aerospace and Mechanical Engineering 2113 or Petroleum Engineering 2113, Mathematics 3113 or concurrent enrollment.
      Required

6. **Specific Goals for the Course:**
   a. **Specific Outcomes of Instruction:**
      At the end of the semester the students:
      i. will have an understanding of fundamental principles of fluid mechanics - conservation of mass, conservation of momentum, conservation of energy - and apply those principles to various engineering problems, including forces on submerged objects, pressure measurements, buoyancy, flow in conduits, open channel flow, flow measurement, forces due to momentum changes, and hydraulic machinery.
      ii. must demonstrate, via quizzes, homework assignments, and exams, both a conceptual understanding and proficiency with analysis and design tools.
      iii. will have the foundation knowledge needed for upper division courses in water resources and environmental engineering.

   b. **Student Outcomes:**
      EAC Outcomes: a, c, e

7. **Brief List of Topics Covered:**
   a. Introduction, fluid properties, and basic considerations;
b. Fluid statics: manometers, forces on plane and curved surfaces, buoyancy, stability;
c. Fluids in motion: flow classification/visualization, Lagrangian vs. Eulerian description, Euler’s equation, Bernoulli equation, linearly accelerating and rotating flows;
d. Control volume analysis: conservation of mass, momentum, and energy;
e. Dimensional analysis and similitude;
f. Flow in conduits: friction losses, minor losses, grade lines, hydraulic machinery;
g. Lift and drag;
h. Miscellaneous topics (as time permits): open channel flow, flow measurement, computational fluid dynamics, compressible flow.
1. **Course Number and Name:**
   CEES 3253, Introduction to Continuum Mechanics

2. **Credits and Contact Hours:**
   3 Credit Hours, 3 hours lecture

3. **Instructor’s or Course Coordinator’s Name:**
   K.K. “Muralee” Muraleetharan

4. **Text Book, Title, Author, and Year:**
   
   a. **Other Supplemental Materials:**
      Links to web pages and access to a finite element computer code, ANSYS.

5. **Specific Course Information:**
   a. **Catalog Description:**
      Mechanics of a deformable continuum, including applications of plane stress, plane strain and an introduction to three-dimensional elastostatics. Thermodynamics of deformable media, including energy formulations suitable for closed-form applications and for computational approximations. Constitutive relations for engineering materials, including nonlinear stress-strain relations and multiphysics problems with coupling of the behavior of solids and fluids within the framework of poromechanics. Considerations for structural mechanics, micromechanics and nanomechanics. (F)

   b. **Prerequisites and/or Co-requisites:**
      Prerequisite: CEES 2153 and MATH 3113

6. **Specific Goals for the Course:**
   a. **Specific Outcomes of Instruction:**
      At the end of the semester the students will:
      i. Understand what a continuum is and the limitations of continuum mechanics based theories to solve real-world problems related to solid, liquids, and gases.
      ii. Know the indicial notation to represent and manipulate tensors.
      iii. Understand a 3-D state of stress and 3-D equations of motion for a continuum.
      iv. Understand 3-D finite and infinite strains in a continuum.
      v. Understand strain compatibility conditions.
      vi. Know how to derive governing equations for a continuum based on material and spatial descriptions.
      vii. Be able to analyze simple engineering structures using a finite element computer program.

   b. **Student Outcomes:**
      EAC Outcomes: a,c,e,k
7. **Brief List of Topics Covered:**
   a. Mathematical Preliminaries
   b. Stress
   c. Deformation and Strain
   d. Motion
   e. Constitutive Equations
   f. Derivations of Field Equations
   g. Modern Engineering Tools
      i. An industry standard finite element computer program, ANSYS
1. **Course Number and Name:**
   CEES 3334, Measurements In CEES

2. **Credits and Contact Hours:**
   4 Credit Hours, Three 50-minute lectures per week, One 170 minute laboratory per week

3. **Instructor’s or Course Coordinator’s Name:**
   Yang Hong

4. **Text Book, Title, Author, and Year:**


**Other Supplemental Materials:**

5. **Specific Course Information:**
   a. **Catalog Description:**
      Introduction to measurement (laboratory and field) techniques, data analysis and interpretation and applications to architectural, civil or environmental engineering and environmental science problems. Topics include statistics, land surveying, remote sensing, GIS, environmental sampling and analysis and sensors.
   
   b. **Prerequisites and/or Co-requisites:**
      Prerequisite: Mathematics 2423, Physics 2424 or Physics 2524
      Required

6. **Specific Goals for the Course:**
   a. **Specific Outcomes of Instruction:**
      At the end of the semester the students will:
      
      i. To provide students with awareness of space and of methodologies to measure distance, elevation, direction, and description of these features.
      ii. Write a professional technical memo in a standard engineering format in order to convey information and give recommendations concerning an engineering problem.
      iii. Understand and be able to apply basic principles of statistics and probability to data sets of varying types.
      iv. Estimate and discuss the accuracy and precision of laboratory or surveying measurements and be knowledgeable concerning sources of error in those measurements.
b. **Student Outcomes:**
   
   EAC Outcomes: a, b, c, k

7. **Brief List of Topics Covered:**

   a. Weeks 1-5, Test 1
      i. Measurements and statistics
      ii. Standard Error and Error Propagation
      iii. Uncertainty, Precision and Accuracy
      iv. Probability concepts
      v. Confidence Intervals
      vi. Hypothesis, z-test and Student t-test

   b. Weeks 6-10, Test 2
      i. Topographic Mapping
      ii. Total Stations
      iii. GPS measurements of horizontal and vertical measurement
      iv. Working with coordinates and GIS

   c. Weeks 11-15, Test 3
      i. Environmental Sampling
      ii. Calibration of Sensors
      iii. Field Surveys
      iv. Term project and laboratory
1. **Course Number and Name:**
   CEES 3364, Soil Mechanics

2. **Credits and Contact Hours:**
   4 Credit Hours, Three 50-minute lectures and one 170 minute laboratory session per week.

3. **Instructor’s or Course Coordinator’s Name:**
   Amy Cerato

4. **Text Book, Title, Author, and Year:**
   “Introduction to Geotechnical Engineering”, Holtz-Kovacs, 1981
   a. **Other Supplemental Materials:**
      None

5. **Specific Course Information:**
   a. **Catalog Description:**
      General treatment of the physical and mechanical properties of soils. Theories of effective stress, consolidation, lateral earth pressure, bearing capacity, slope stability and groundwater flow. **Laboratory (F)**
   b. **Prerequisites and/or Co-requisites:**
      Prerequisite: CEES 2153.
      Required

6. **Specific Goals for the Course:**
   a. **Specific Outcomes of Instruction:**
      At the end of the semester the students will:
      i. Have an understanding of the fundamental behavior of soil with regard to applications in geotechnical engineering.
   b. **Student Outcomes:**
      EAC Outcomes: a, b, c, e, g, k

7. **Brief List of Topics Covered:**
   a. Laboratory tour/slide show on Geotechnics
   b. Soil identification/phase relationships - ASTM D2488
   c. Soil classification - ASTM D2487, D422, D4318
   d. Soil survey exercise
   e. Soil compaction - ASTM D698, D1557
   f. Permeability and seepage
   g. Video seminar (deep dynamic compaction, trenchless technology)
   h. Oedometer test - ASTM D2435
   i. Geotechnical exploration exercise
   j. Direct shear test - ASTM D3080
   k. Unconfined compression test - ASTM D2166
   l. Triaxial compression test - ASTM 4767
   m. Geosynthetics seminar
1. **Course Number and Name:**
   CEES 3403, Materials

2. **Credits and Contact Hours:**
   3 Credit Hours, Two 50-minute lectures per week and one 100-minute laboratory session per week

3. **Instructor’s or Course Coordinator’s Name:**
   Chris Ramseyer

4. **Text Book, Title, Author, and Year:**
   “Basic Construction Materials”, Marotta, 2005 7th Edition
   a. **Other Supplemental Materials:**
      None

5. **Specific Course Information:**
   a. **Catalog Description:**
      Study of the properties of materials utilized by architectural and civil engineers; analyses of aggregates, concrete, masonry, steel, asphalt, plastics and wood.
      **Laboratory** (Sp)
   b. **Prerequisites and/or Co-requisites:**
      Prerequisite: 2153 or concurrent enrollment.
      Required

6. **Specific Goals for the Course:**
   a. **Specific Outcomes of Instruction:**
      At the end of the semester the students will:
      i. Graduates will understand the behavior of common civil engineering materials.
      ii. Graduates will understand the vocabulary and terminology of civil engineering materials
      iii. Graduates will be able perform simple laboratory tests following the ASTM guidelines.
   b. **Student Outcomes:**
      EAC Outcomes: a, b, g

7. **Brief List of Topics Covered:**
   a. Basic tests of aggregate
   b. Properties of aggregate for concrete
   c. Types of Portland cement
   d. Proportioning of concrete mixtures
   e. Tests of concrete qualities
f. Civil Engineering materials (concrete, masonry, wood and metals) vocabulary and terminology

g. Properties of brick, mortar and masonry assemblies

h. Crystal structure, impurities, and alloys in steel

i. Steel manufacturing processes and terminology

j. Effects of heat treatment and cold working on steel

k. Typical structural and reinforcing steels

l. Wood terminology, properties, and grading

m. Elastic buckling of slender columns
1. **Course Number and Name:**
   CEES 3414, Structural Analysis

2. **Credits and Contact Hours:**
   4 Credit Hours, Three 75-minute lectures per week

3. **Instructor’s or Course Coordinator’s Name:**
   Chris Ramseyer

4. **Text Book, Title, Author, and Year:**
   “Structural Analysis”, Hibbeler, 2009 7th Edition
   a. **Other Supplemental Materials:**
      None

5. **Specific Course Information:**
   a. **Catalog Description:**
      Loads, reactions and force systems; introduction to design codes; analysis of frames and trusses; calculation of structural deformations; and analysis of indeterminate structures. Emphasis on classical solutions and time-tested approaches to structural engineering. Introduction to structural analysis computer programs to solve complex problems. (F)
   b. **Prerequisites and/or Co-requisites:**
      Prerequisite: 2153
      Required

6. **Specific Goals for the Course:**
   a. **Specific Outcomes of Instruction:**
      At the end of the semester the students will:
      i. Students will be able to analyze structures utilizing classical methods.
   b. **Student Outcomes:**
      EAC Outcomes: a, c, d, e, k

7. **Brief List of Topics Covered:**
   a. Classifications of structures and loads
   b. Shear, thrust, and bending moments for beams and frames
   c. Determinate trusses
   d. Catenary structures and arches
   e. Curvature and deflection of beams, frames and trusses
   f. Introduction to classical analysis methods for determinate beams, frame and trusses
   g. Analysis of indeterminate structures
   h. Approximate methods for analysis of indeterminate structures
1. **Course Number and Name:**
   CEES 3774, Structural Design – Concrete and Steel

2. **Credits and Contact Hours:**
   4 Credit Hours, Three 75-minute lectures and one 110-minute laboratory session per week

3. **Instructor’s or Course Coordinator’s Name:**
   Chris Ramseyer

4. **Text Book, Title, Author, and Year:**
   “ACI 318-05 Building Code and Commentary”, ACI, 2005
   “Design of Concrete Structures”, Nilson, Darwin and Dolan, 2003
   “Structural Steel Design”, McCormac, 2008
   a. **Other Supplemental Materials:**
      None

5. **Specific Course Information:**
   a. **Catalog Description**
      Design of structural members constructed of reinforced concrete and/or steel. Concrete design will include beams in flexure/shear, one way slabs, development length, serviceability and an introduction to columns. Steel design will include tension elements, columns, beams, beam columns and an introduction to connections. Laboratory (Sp)
   b. **Prerequisites and/or Co-requisites:**
      Prerequisite: 3403 and 3414.
      Required

6. **Specific Goals for the Course:**
   a. **Specific Outcomes of Instruction:**
      At the end of the semester the students will:
      i. Graduates will be able to design tension elements, columns and beams using the AISC design specification for steel construction using both ASD and LRFD methods
      ii. Graduates will be able to design concrete beams for both flexure and shear using the ACI 318-05 design specification.
      iii. Graduates will be able to design concrete columns using the ACI 318-05 design specification
   b. **Student Outcomes:**
      EAC Outcomes: a, c, e, f, k

7. **Brief List of Topics Covered:**
a. Steel tension members, yielding of the gross section and fracture of the net section.
b. Steel compression member design including effective length factors
c. Slenderness factors
d. Local vs. global buckling issues
e. Steel flexural member design
f. Lateral – Torsional buckling issues
g. Concrete beam design for singly reinforced beams dealing with both flexure and shear
h. Serviceability issues
i. Development of reinforcement in concrete structures
j. Concrete column design
1. **Course Number and Name:**
   CEES 4113, Building Lighting and Electrical Systems

2. **Credits and Contact Hours:**
   3 Credit Hours, Three 50-minute lectures per week

3. **Instructor’s or Course Coordinator’s Name:**
   Cliff Fitzmorris

4. **Text Book, Title, Author, and Year:**
   “Mechanical and Electrical Equipment for Buildings, Stein, Reynolds, Grondzik and Kwok, 2005
   
   a. **Other Supplemental Materials:**
      None

5. **Specific Course Information:**
   a. **Catalog Description:**
      Fundamentals of building lighting and electrical systems. Lighting topics include the determination of appropriate lighting quantity and quality, luminaires and lighting design procedures for residential, commercial and industrial buildings. Electrical topics will include service voltages, overcurrent protection, short circuit analysis and branch circuit design for residential, commercial and industrial buildings. (F)

   b. **Prerequisites and/or Co-requisites:**
      Prerequisite: Mathematics, 2423, Physics 2524, Engineering 2431 or equivalents. Required

6. **Specific Goals for the Course:**
   a. **Specific Outcomes of Instruction:**
      At the end of the semester the students will:
      Understand luminous intensity, luminous flux, and illuminance.
      Measure illuminance, reflectance, and transmittance.
      Understand color temperature and color rendering index.
      Understand fundamental properties of luminaires.
      Interpret a photometric plot for a luminaire.
      Understand the lighting design process.
      Analyze an existing lighting design.
      Design the lighting for a given space.
      Determine appropriate illuminance levels using IESNA codes.
      Determine appropriate lighting efficiency using ASHRAE codes.
      Use professional lighting design/simulation software.
      Present a lighting analysis and a lighting design.
      Understand single phase and three phase electrical systems.
      Choose conductor sizes using NEC codes.
      Understand basic commercial and residential electrical safety codes.
Create a load estimate for a given building.

b. **Student Outcomes:**  
   EAC Outcomes: a, b, c, g, k

7. **Brief List of Topics Covered:**  
   This course will give the student an opportunity to learn the fundamentals of building lighting and electrical systems. Lighting topics include the determination of appropriate lighting quantity and quality, luminaires, and lighting design procedures for residential, commercial, and industrial buildings. Electrical topics will include service voltages, overcurrent protection, short circuit analysis, and branch circuit design for residential, commercial, and industrial buildings.
1. **Course Number and Name:**
   G4333, Foundation Engineering

2. **Credits and Contact Hours:**
   3 Credit Hours, Two 75-minute lectures per week

3. **Instructor’s or Course Coordinator’s Name:**
   Amy Cerato

4. **Text Book, Title, Author, and Year:**
   a. **Other Supplemental Materials:**
   None

5. **Specific Course Information:**
   a. **Catalog Description:**
   Substructure analysis and design to meet various soil conditions; footings and rafts, shoring and underpinning, piles, cofferdams, caissons, breakwaters, piers, wharves, vibratory effects on foundations. (Sp)
   b. **Prerequisites and/or Co-requisites:**
   Prerequisite: CEES 3364.
   Required

6. **Specific Goals for the Course:**
   a. **Specific Outcomes of Instruction:**
   At the end of the semester the students will: Understand how to gather and analyze site and subsurface information to design shallow and axial loaded deep foundations.
   b. **Student Outcomes:**
   EAC Outcomes: a,c,e,g,j,k

7. **Brief List of Topics Covered:**
   a. Site Reconnaissance
   b. In Situ Testing
   c. Shallow Foundation Design
   d. Deep Foundation Design
   e. Case Histories of Geotechnical Engineering Failures
1. Course Number and Name:
   CEES G4753, Structural Design - Wood

2. Credits and Contact Hours:
   3 Credit Hour, Three 50-minute lectures per week

3. Instructor’s or Course Coordinator’s Name:
   David P. Swyden

4. Text Book, Title, Author, and Year:
   Design of Wood Structures, Breyer, Fridley, Cobein and Pollock, 2007
   a. Other Supplemental Materials:
      Selected handouts from the latest edition (2005) of the National Design
      Specification for Wood Construction (NDS) published by the American Wood
      Council.

5. Specific Course Information:
   a. Catalog Description:
      Material properties and behavior of wood. Analysis and design of solid and
      laminated structural members, connections, systems, trusses and arches. Current
      developments in structural wood design and research. (F)
   b. Prerequisites and/or Co-requisites:
      Prerequisite: CEES 3414 or equivalent.
      Required

6. Specific Goals for the Course:
   a. Specific Outcomes of Instruction:
      At the end of the semester the students will:
      i. Gain an understanding of the processes used for designing timber
         structural members (e.g., beams and columns).
      ii. Gain an understanding of the processes used for designing timber
          structural systems (e.g., floor diaphragms and shearwalls).
      iii. Gain an understanding of the building code’s provisions for gravity and
           lateral loads, and how these provisions translate into timber design
           practice.
   b. Student Outcomes:
      EAC Outcomes: a, c, e, j & k

7. Brief List of Topics Covered:
   a. Consideration of timber as a building material
   b. Response of timber building elements to applied loads
      i. Gravity and lateral loads
      ii. Load combinations
iii. Load duration factors
c. Design of building components
   i. Beams
   ii. Columns
d. Design of integrated structural systems
   i. Flexible diaphragms
   ii. Shearwalls
e. Application of the building code to common design scenarios
   i. Single and multistory residences
   ii. Light commercial buildings
f. Timber construction details
   i. Steel connection hardware
   ii. Application to local, regional and national hazards
g. Brief survey of recent research in wood and discussion of industry publications on best practices of wood construction
1. **Course Number and Name:**
   CEES 4803 Civil Engineering Professional Practice

2. **Credits and Contact Hours:**
   3 Credit Hours, One 180 minute lecture per week

3. **Instructor’s or Course Coordinator’s Name:**
   Robert C. Knox

4. **Text Book, Title, Author, and Year:**
   None
   a. **Other Supplemental Materials:**
      None

5. **Specific Course Information:**
   a. **Catalog Description:**
      Introduces students to both technical and non-traditional aspects of professional practice. Technical emphases include discipline-specific instruction on the design process. Architectural engineers are trained in design of building plumbing and electrical systems. Civil engineers are trained on structural and foundation design. Both disciplines receive training on non-technical aspects of professional practice including organization, project management, ethics and communications. (F)
   
   b. **Prerequisites and/or Co-requisites:**
      Prerequisite: Senior standing in Architectural or Civil Engineering. Architectural engineers must also have Engineering 2431 or concurrent enrollment.
      Required

6. **Specific Goals for the Course:**
   a. **Specific Outcomes of Instruction:**
      At the end of the semester the students will:
      i. Be trained in non-technical areas needed for professional practice.
      ii. Have developed an understanding of the future of professional practice.
   
   b. **Student Outcomes:**
      EAC Outcomes: d, f,

7. **Brief List of Topics Covered:**
   
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<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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<td>Personality tests, Resume development</td>
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<td>(2)</td>
<td>Team assignments, Oral Communications</td>
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<td>Team building, Brainstorming, Charette Assignment</td>
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<td>(4-5)</td>
<td>Ethics</td>
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<td>(9)</td>
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</table>
(10) Starting Your Engineering Business
(11) Economics, Time Value of Money
(12) Professional Registration and the Body of Knowledge
(13-14) Economics, Money and the Engineer
1. **Course Number and Name:**
   CEES 4993, Architectural Engineering Capstone

2. **Credits and Contact Hours:**
   3 Credit Hour, 3 hour lecture

3. **Instructor’s or Course Coordinator’s Name:**
   Gerald A. Miller, Ph.D., P.E. and Thomas Kang, Ph.D., P.E.

4. **Text Book, Title, Author, and Year:**
   None
   a. **Other Supplemental Materials:**
      Various handouts

5. **Specific Course Information:**
   a. **Catalog Description:**
      A capstone course emphasizing design of structural components and
      environmental systems of buildings. Requires students to have knowledge and
      skills from prerequisite courses to address a real-world, open-ended design
      problem. Required for Architectural Engineering students. The capstone project
      will be under direct faculty supervision. (Sp)
   
   b. **Prerequisites and/or Co-requisites:**
      Prerequisites: CEES 3364, CEES 3774, CEES 4113, CEES 4803 and AME 4653.
      Required

6. **Specific Goals for the Course:**
   a. **Specific Outcomes of Instruction:**
      At the end of the semester the students will:
      i. Complete Preliminary Architectural Design – building footprint, allocation
         and dimensions of internal spaces based on function (e.g. multiuse – office
         space, classrooms, laboratory space etc.), layout of surrounding site (e.g.
         parking, grassed areas, etc.)
      ii. Complete preliminary design of mechanical, electrical and plumbing
          systems.
      iii. Achieve a certain level of LEED Certification for the facility; provide
           documentation to support the level of certification of the design.
      iv. Complete Preliminary Structural Design – design of all load bearing
          structural members (columns, beams, walls, foundations, retaining walls,
          cranes, floor slabs, etc.)
      v. Develop a preliminary cost estimate for the design and construction
         associated with the building and site.
   
   b. **Student Outcomes:**
      EAC Outcomes: d, e, g, j, k
7. **Brief List of Topics Covered:**

This course is not like a traditional course in the sense that lecture periods are not spent lecturing on specific topics. Rather, the instructors act as facilitators to guide the students through the design process. Tuesday meeting times are used to disseminate information to students and meet individually with each group to discuss their design progress and address issues they have. Two of these periods are used for the 66% and 100% design presentations. Selected topics are discussed in more detail as needed by the instructors or invited speakers. Some of the topics covered include:

a. Overview of building design and building codes within project constraints  
b. Overview of effective methods of team work and project administration  
c. Overview of LEED certification (invited speaker)  
d. Overview of cost estimation using Means Costworks software  
e. Overview of project report preparation  
f. Overview of effective project presentation  
g. Overview of selected topics in architectural, structural, geotechnical and general civil engineering
1. **Course Number and Name:**
   CHEM 1315, General Chemistry

2. **Credits and Contact Hours:**
   5 Credit Hours, 3 hours lecture, 3 hours laboratory, 1.5 hours recitation

3. **Instructor’s or Course Coordinator’s Name:**
   Michael R. Abraham

4. **Text Book, Title, Author, and Year:**
   Chemistry 2nd Ed. –Burdge, McGraw-Hill, 2011
   a. **Other Supplemental Materials:**
      - HTT TX 3200 RF Clicker
      - Desire to Learn (D2L) learn.ou.edu
      - Web Assign.net
      - Approved Safety Googles

5. **Specific Course Information:**
   a. **Catalog Description:**
      First of a two-semester sequence in general chemistry. Topics covered: basic measurement, gas laws and changes in state, stoichiometry, atomic theory, electron configuration, periodicity, bonding, molecular structure and thermochemistry. **Laboratory** (F, Sp, Su)
   b. **Prerequisites and/or Co-requisites:**
      Prerequisite: Mathematics 1503 or 1643, or math ACT equal to or greater than 23.

6. **Specific Goals for the Course:**
   a. **Specific Outcomes of Instruction:**
      Chemistry 1315 is the beginning general chemistry course for students in the physical sciences, engineering, health sciences, biological sciences, and related fields. At the end of the semester the students will:
      1. Have a good understanding of the concepts associated with the course.
      2. Be able to collect and interpret laboratory information supporting the development of the concepts associated with the course.
      3. Begin to develop the science processes of a laboratory science.
      4. Relate the submicroscopic, macroscopic, and symbolic representations of chemical systems with each other.
   b. **Student Outcomes:**
      EAC outcomes: a, b
      CAC Outcomes: a
7. **Brief List of Topics Covered:**
   1. Basic Concepts, Atoms, Molecules & Ions
   2. Stoichiometry
   3. Theromochemistry
   4. Atomic Structure & Periodicity
   5. Molecular Structure and Bonding
   6. Properties of Gases
   7. Properties of Liquids, Solids, and Solutions
   8. Organic Chemistry
1. **Course Number and Name:**
   ENGL 3153, Technical Writing

2. **Credits and Contact Hours:**
   3 Credit Hour, 3 hours lecture/discussion/peer writing-editing

3. **Instructor’s or Course Coordinator’s Name:**
   Office of First Year Composition
   Department of English, Gittinger Hall, Room 122

4. **Text Book, Title, Author, and Year:**
   *Handbook of Technical Writing*, 8th ed. G. Alred et al., 2006 [Recommended.]
   Other readings and handouts to be distributed through Desire to Learn (D2L).

5. **Specific Course Information:**
   a. **Catalog Description:**
      Focuses on the forms of report writing most frequently encountered in research and industry. (F, Sp, Su)
   b. **Prerequisites and/or Co-requisites:**
      Prerequisite: ENGL 2153 and Engineering or hard science majors only. Required

6. **Specific Goals for the Course:**
   a. **Specific Outcomes of Instruction:**
      To introduce the writing process and improve skills needed for effective informational and persuasive written communications in technical and professional applications.
   b. **Student Outcomes:**
      EAC and CAC Outcomes: EAC g, CAC f

7. **Brief List of Topics Covered:**
   a. Introduction to genres of workplace writing in order to enable audience(s) to accomplish a task, understand a technical subject, solve a problem or make a decision.

   b. Pragmatic orientation to resumes, business correspondence, short reports, proposals, progress reports, and completion reports.

   c. Rhetorical skills necessary for effective technical communications, identifying and profiling target audiences, writing for specific purposes, and appealing to audience values through traditional rhetorical strategies, document design and presentation.

   d. Workshop and writing experiences sequenced to model of writing process: planning, drafting, revising, editing, and proofreading.
1. **Course Number and Name:**
   ENGR 1410, Freshman Engineering Orientation

2. **Credits and Contact Hours:**
   0 Credit Hours, 1 hour lecture, 2 hours laboratory

3. **Instructor’s or Course Coordinator’s Name:**
   P. Simin Pulat

4. **Text Book, Title, Author, and Year:**
   None
   - **Other Supplemental Materials:**
     Engineering Grand Challenges

5. **Specific Course Information:**
   - **Catalog Description:**
     Required orientation course for specified majors. Covers a variety of topics including: majors and minors; career planning; advising; and extra-curricular activities. (F)
   - **Prerequisites and/or Co-requisites:**
     Prerequisite: freshman majoring in Civil Engineering, Architectural Engineering, Environmental Engineering, or Environmental Science.
     Required

6. **Specific Goals for the Course:**
   - **Specific Outcomes of Instruction:**
     At the end of the semester the students will:
     i. Know that engineering is multidisciplinary.
     ii. Be able to name at least five different disciplines in engineering.
     iii. Have met at least five upper-class engineering students who have successfully walked the path of a first-year engineering student.
     iv. Know in detail what at least one discipline of engineering does upon graduation.
     v. Have attended at least two engineering-sponsored events outside of class.
     vi. Have visited the Engineering Courtyard and know the four engineering buildings.
     vii. Know where the Career Services is located and the services provided by them
     viii. Be familiar with and understand the value of study abroad, research, internship and co-op opportunities and the process of applying for one
     ix. Be familiar with the advising process and Degree Navigator
     x. Experience engineering problem solving in a multidisciplinary team environment
     xi. Attend “Engineering Freshman Showcase Day” to observe student project experiences in other sections.
b. **Student Outcomes:**
   EAC Outcomes: d,h

7. **Brief List of Topics Covered:**
   a. Degree Navigator
   b. Student Leadership Opportunities
   c. Competition Teams
   d. Career fair and Internships
   e. Study Abroad
   f. Research Opportunities
   g. Interaction with Deans Leadership Council Mentors
   h. Exploring Majors and Minors
   i. Small Section Experiences
      i. Hovercraft
      ii. Pumpkin Drop
      iii. Chemical Car
      iv. Engineering Design (varying projects)
      v. Botball - Robots
      vi. Lego Mindstorm - Robots
      vii. Interactive Game Development
      viii. Energy – Oil and Gas Industry
         ix. Interface between Physics and Engineering
         x. Lasers, Transistors, Energy Conversion
         xi. Circuit Design
         xii. Bioengineering
         xiii. Engineering Outreach - Elementary
         xiv. Service Learning
1. **Course Number and Name:**
   ENGR 2431, Electrical Circuits

2. **Credits and Contact Hours:**
   1 Credit Hour, 1 hour lecture

3. **Instructor’s or Course Coordinator’s Name:**
   Chad Davis

4. **Text Book, Title, Author, and Year:**
   
   a. **Other Supplemental Materials:**

5. **Specific Course Information:**
   a. **Catalog Description:** Introduction to basic principles of electrical circuits. Topics include DC circuits analysis, DC transients, static electrical fields, static magnetic fields, capacitors, inductors, and filters. (F, Sp)
   b. **Prerequisites and/or Co-requisites:**
      Math 2423 and Phys 2524 or concurrent enrollment.
      Required

6. **Specific Goals for the Course:**
   a. **Specific Outcomes of Instruction:**

   b. **Student Outcomes:**
      EAC and CAC Outcomes: a

7. **Brief List of Topics Covered:**
   1. Circuits (DC circuits, AC circuits, resonance, AC transients, DC transients)
   2. Static electrical Fields
   3. Static Magnetic Fields
   4. Electronics (diodes, operational amplifiers
1. **Course Number and Name:**
   ENGR 3401, Engineering Economics

2. **Credits and Contact Hours:**
   1 Credit Hour, 1 hour lecture

3. **Instructor’s or Course Coordinator’s Name:**
   B. Mustafa Pulat

4. **Text Book, Title, Author, and Year:**

5. **Specific Course Information:**
   a. **Catalog Description:**
      Introduction to basic principles of engineering economics. Topics include value and interest, cash flow diagrams, cash flow patterns, equivalence of cash flow patterns, unusual cash flows and interest periods, evaluating alternatives (annual equivalent cost comparisons, present equivalent cost comparisons, incremental approach, rate of return comparisons, benefit/cost comparisons, MARR, replacement problems, always ignore the past, break-even analysis), income tax and depreciation, and inflation. (F)

   b. **Prerequisites and/or Co-requisites:**
      Prerequisite: Mathematics 1823
      Required

6. **Specific Goals for the Course:**
   a. **Specific Outcomes of Instruction:**
      At the end of the semester the students will:
      i. Know that money has time value.
      ii. Know the difference between simple and compound interest.
      iii. Be able to carry out equivalence calculations with single sums and series of cash flows.
      iv. Be able to make absolute “feasible/infeasible” cash flow/investment decisions.
      v. Be able to make relative “chose one over the other” type cash flow/investment decisions.
      vi. Be able to recognize and evaluate the effects of equivalence, replacement issues, taxes, depreciation, changing rates, break-even conditions, and investments in the public sector.

   b. **Student Outcomes:**
      EAC Outcomes: a, e, i, j, k

7. **Brief List of Topics Covered:**
   a. Why engineering economy
b. Cost concepts
c. Time value of money (simple/compound interest)
d. Matching interest and cash flow periodicities
e. Equivalence calculations (single sums and series of cash flows)
f. Inflation effects
g. Changing rates
h. Measuring “worth” of investments
i. Making “go/no-go” decisions for one option investment case under different worth evaluation techniques.
j. Selecting investments (relative decisions).
k. Sensitivity analysis.
l. Income taxes, depreciation.
m. Replacement analysis.
n. Public projects.
1. **Course Number and Name:**
   MATH 1823 Calculus and Analytic Geometry I

2. **Credits and Contact Hours:**
   3 Credit Hour, 3 hours lecture, 1 hour discussion

3. **Instructor’s or Course Coordinator’s Name:**
   Paul Goodey

4. **Text Book, Title, Author, and Year:**

5. **Specific Course Information:**
   a. **Catalog Description:**
      Topics covered include equations of straight lines; conic sections; functions, limits and continuity; differentiation; maximum-minimum theory and curve sketching. A student may not receive credit for this course and 1743. (F, Sp, Su)
   
   b. **Prerequisites and/or Co-requisites:**
      Prerequisite: 1523 at OU, or satisfactory score on the placement test, or, for incoming freshmen direct from high school, satisfactory score on the ACT/SAT. Required

6. **Specific Goals for the Course:**
   a. **Specific Outcomes of Instruction:**
      By the end of the semester the students will learn the basic concepts of single-variable, differential calculus, as well as its applications to curve sketching and maximum/minimum problems.
   
   b. **Student Outcomes:**
      EAC and CAC Outcomes: a

7. **Brief List of Topics Covered:**
   a. Functions and their graphs
   b. Limits and Continuity of functions
   c. Tangent lines and the derivative
   d. Differentiation formula, chain rule, implicit differentiation
   e. The derivative as a rate of change, related rate problems, velocity
   f. Newton’s method
   g. Curve sketching using the derivative (including concavity, inflection points, asymptotes)
   h. Applied max-min problems
1. **Course Number and Name:**
   MATH 2423 Calculus and Analytic Geometry II

2. **Credits and Contact Hours:**
   3 Credit Hour, 3 hours lecture, 1 hour discussion

3. **Instructor’s or Course Coordinator’s Name:**
   Paul Goodey

4. **Text Book, Title, Author, and Year:**

5. **Specific Course Information:**
   a. **Catalog Description:**
      Integration and its applications; the calculus of transcendental functions; techniques of integration; and the introduction to differential equations. A student may not receive credit for this course and 2123. (F, Sp, Su)
   b. **Prerequisites and/or Co-requisites:**
      Prerequisite: Math 1823
      Required

6. **Specific Goals for the Course:**
   a. **Specific Outcomes of Instruction:**
      By the end of the semester the students will learn the basic concepts of single-variable, integral calculus, as well as its applications to area, work centers of mass, etc.
   b. **Student Outcomes:**
      EAC and CAC Outcomes: a

7. **Brief List of Topics Covered:**
   a. Areas and distances
   b. The definite integral
   c. Fundamental theorem of calculus
   d. Indefinite integrals
   e. Substitution
   f. Areas between curves
   g. Volumes
   h. Work
   i. Average value of a function
   j. Inverse, logarithmic, exponential, inverse trig, and hyperbolic functions
   k. l’Hospital’s rule
   l. Techniques of integration, numerical and improper integrals
1. **Course Number and Name:**
   MATH 2433 Calculus and Analytic Geometry III

2. **Credits and Contact Hours:**
   3 Credit Hour, 3 hours lecture

3. **Instructor’s or Course Coordinator’s Name:**
   Paul Goodey

4. **Text Book, Title, Author, and Year:**

5. **Specific Course Information:**
   a. **Catalog Description:**
      Polar coordinates, parametric equations, sequences, infinite series, vector analysis. (F, Sp, Su)
   b. **Prerequisites and/or Co-requisites:**
      Prerequisite: Math 2423
      Required

6. **Specific Goals for the Course:**
   a. **Specific Outcomes of Instruction:**
      This course serves as a bridge between single variable and multivariable calculus. Single variable calculus is completed via the study of sequences and series. The study of parametric equations, vector techniques and higher dimensional parameterizations form the basis of multivariable calculus.

   b. **Student Outcomes:**
      EAC and CAC Outcomes: a

7. **Brief List of Topics Covered:**
   a. Curves defined by parametric equations
   b. Tangents to and areas enclosed by parametric equations
   c. Polar coordinates, conic sections
   d. Sequences and series
   e. Tests for convergence of series
   f. Power series, Taylor and MacLaurin series
   g. Three dimensional coordinate systems and vectors
   h. Vector dot and cross products
   i. Equations of lines and planes
   j. Quadratic surfaces
   k. Vector functions, arc length, space curves (velocity and acceleration)
1. **Course Number and Name:**
   MATH 2443 Calculus and Analytic Geometry IV

2. **Credits and Contact Hours:**
   3 Credit Hour, 3 hours lecture

3. **Instructor’s or Course Coordinator’s Name:**
   Paul Goodey

4. **Text Book, Title, Author, and Year:**

5. **Specific Course Information:**
   a. **Catalog Description:**
      Vector calculus; functions of several variables; partial derivatives; gradients, extreme values and differentials of multivariate functions; multiple integrals; line and surface integrals. (F, Sp, Su)
   b. **Prerequisites and/or Co-requisites:**
      Prerequisite: Math 2433
      Required

6. **Specific Goals for the Course:**
   a. **Specific Outcomes of Instruction:**
      Students will learn basic concepts of multivariable differential and integral calculus, and their applications including the fundamental theorems of Green, Gauss, and Stokes.
   b. **Student Outcomes:**
      EAC and CAC Outcomes: a

7. **Brief List of Topics Covered:**
   a. Functions of several variables, limits, and continuity
   b. Partial derivatives, tangent planes and differentials, the chain rule of partial derivatives
   c. Directional derivatives and gradients
   d. Max/min problems, Lagrange multiplier method
   e. Double and triple integrals, surface area, volumes, and other applications
   f. Double integrals in polar coordinates, triple integrals in cylindrical and spherical coordinates
   g. Vector fields, line integrals, Green’s theorem
   h. Divergence and curl of a vector field
   i. Parametric surfaces, surface integrals, and surface area
   j. Stoke’s theorem and the divergence theorem
   k. Cylindrical and spherical coordinates
1. Course Number and Name:
   MATH 3113 Introduction to Ordinary Differential Equations

2. Credits and Contact Hours:
   3 Credit Hour, 3 hours lecture

3. Instructor’s or Course Coordinator’s Name:
   Paul Goddey

4. Text Book, Title, Author, and Year:

5. Specific Course Information:
   a. Catalog Description:
      First order ordinary differential equations, linear differential equations with
      constant coefficients, two-by-two linear systems, Laplace transformations, phase
      planes and stability. (F, Sp, Su)
   b. Prerequisites and/or Co-requisites:
      Prerequisite: Math 2423
      Required

6. Specific Goals for the Course:
   a. Specific Outcomes of Instruction:
      Students will be introduced to basic solution methods for ordinary differential
      equations of the following types: first-order equations, higher-order linear
      equations with constant coefficients and rudimentary first-order systems. These
      methods include Laplace transforms.
   b. Student Outcomes:
      EAC and CAC Outcomes: a

7. Brief List of Topics Covered:
   a. First-order differential equations
   b. Linear equations of higher order
   c. Introduction to systems of differential equations
   d. Linear systems of differential equations
   e. Laplace transform method
1. **Course Number and Name:**
   PHYS 2514, Introductory Physics for Engineers

2. **Credits and Contact Hours:**
   4 Credit Hours, 3 hour lecture, 1 hour discussion

3. **Instructor’s or Course Coordinator’s Name:**
   Kieran Mullen

4. **Text Book, Title, Author, and Year:**
   a. **Other Supplemental Materials:**
      [www.masteringphysics.com](http://www.masteringphysics.com) and course site on University Desire to Learn (D2L)

5. **Specific Course Information:**
   a. **Catalog Description:**
      Vectors, kinematics and dynamics of particles, work and energy systems of particles, rotational kinematics and dynamics, oscillations, gravitation, fluid mechanics, waves. (F, Sp, Su)
   
   b. **Prerequisites and/or Co-requisites:**
      Prerequisite: Mathematics 1823 or Mathematics 1914 with grade of C or better.
      Not open to students with credit in 1205.

6. **Specific Goals for the Course:**
   a. **Specific Outcomes of Instruction:**
      The students will learn about the physical principles governing mechanical systems
   
   b. **Student Outcomes:**
      EAC Outcome: a
      CAC Outcome: a

7. **Brief List of Topics Covered:**
   1. Concepts in Motion
   2. Kinematics: the Mathematics of Motion
   3. Vectors and Coordinate Systems
   4. Force and Motion
   5. Dynamics I: Motion Along a Line
   6. Dynamics II: Motion in a Plane
   7. Dynamics III: Motion in a Circle
   8. Newton’s Third Law
   9. Impulse and Momentum
   10. Energy
   11. Work
   12. Newton’s Theory of Gravity
   13. Rotation of a Rigid Body
   14. Oscillations
   15. Fluids and Elasticity
1. **Course Number and Name:**  
   PHYS 2524, General Physics II for Engineering and Science Majors

2. **Credits and Contact Hours:**  
   4 Credit Hours, 3 hour lecture, 1 hour discussion

3. **Instructor’s or Course Coordinator’s Name:**  
   Lloyd Bumm

4. **Text Book, Title, Author, and Year:**  
   a. **Other Supplemental Materials:**  
      www.masteringphysics.com and course site on University Desire to Learn (D2L), learn.ou.edu

5. **Specific Course Information:**  
   a. **Catalog Description:**  
      Temperature, heat, thermodynamics, electricity, magnetism, optics. (F, Sp, Su)
   
   b. **Prerequisites and/or Co-requisites:**  
      Phys 2514 and Math 2423. Not open to students with credit in Phys 1215.

6. **Specific Goals for the Course:**  
   a. **Specific Outcomes of Instruction:**  
      The students will learn about physical principles governing electromagnetic systems and radiation
   
   b. **Student Outcomes:**  
      EAC Outcome: a  
      CAC Outcome: a

7. **Brief List of Topics Covered:**  
   1. A Macroscopic Description of Matter
   3. The Micro/Macro Connection
   4. Heat Engines and Refrigerators
   5. Electric Charges and Forces
   6. The Electric Field
   7. Gauss’s Law
   8. Current and Conductivity
   9. The Electric Potential
   10. Potential and Field
   11. Fundamentals of Circuits
   12. The Magnetic Field
   13. Electromagnetic Induction
   14. Electromagnetic Fields and Waves
   15. AC Circuits
Appendix B – Faculty Vitae

1. Name:
ELIZABETH C. BUTLER

2. Education
B.S. Chemistry, University of Maryland, 1985
M.S. Civil Engineering, University of Maryland, 1991
Ph.D. Environmental Engineering, University of Michigan, 1998

3. Academic experience
University of Oklahoma, Full Professor, 2010-present, Full time
University of Oklahoma, Associate Professor, 2005 – 2010, Full time
University of Oklahoma, Assistant Professor, 1999 – 2005, Full time

4. Non-academic experience
Environmental Scientist, Halliburton NUS Corporation, Gaithersburg, Maryland (now Tetra Tech NUS, Inc.), 1986 - 1991
Junior Staff Scientist, Dynamac Corporation, Rockville, Maryland, 1985 - 1986
Laboratory Technician, U. S. Department of Agriculture, Beltsville Agricultural Research Center, Beltsville, Maryland, 1984-1985

5. Certifications or professional registrations
Not applicable

6. Current membership in professional organization
Association of Environmental Engineering and Science Professors, American Chemical Society, Environmental Chemistry Division

7. Honors and awards
Larry W. Canter Influencing Environmental Interest Award (chosen by department students) (2009, 2010), College of Engineering Alumni Teaching Award (Fall 2008), Environmental Science & Technology Excellence in Review Award (2008), George W. Tauxe Outstanding Professor Award (chosen by department students) (2002), National Science Foundation CAREER Award (2001-2006), University of Oklahoma Junior Faculty Research Award (2001)

8. Service activities (last 5 years)
University Level: Member: Research Council (Fall 2009-present), Panelist: English Assessment Program TEACH test (2007, 2008), Speaker: Fundamentals for Faculty Workshop, Office of Research Services (8/18/05), Member: Graduate Council (2004-2007), Member: Graduate Council Graduate Faculty Subcommittee (Spring 2007), Member Graduate Council Subcommittee to evaluate Eddie Carol Smith Scholarship applications (Spring 2007), Member: Graduate Council Research and Travel Grant Subcommittee (Spring 2006), Member: Provost Graduate Teaching Awards Committee (Spring 2006), Member: Graduate Council Graduate Faculty Subcommittee (Fall 2006)
**College Level:** Faculty Advisor: Society of Women Engineers (SWE) (2005-2009)

**School Level:** Chair: CEES Student Performance Review Committee (2005-2008), Chair: CEES Undergraduate Curriculum Committee (2008-present), Member: CEES Undergraduate Curriculum Committee (2000-2008), Member: CEES Scholarship Committee (Fall 2004-present)

**Professional Service:** Associate Editor, *Chemosphere, Science for Environmental Technology* section (2011-present), Member: Association of Environmental Engineering and Science Professors (AEESP) Doctoral Dissertation Awards Committee (2009-present) (committee chair in 2010), Member: Association of Environmental Engineering and Science Professors (AEESP)/American Chemical Society Joint Session Planning Committee (2001-2007), ad hoc reviewer for numerous journals and funding agencies.

### 9. Publications in the last 5 years


### Presentations in the last 5 years (9—not listed due to space constraints)

#### 10. Professional development activities (last 5 years)

1. Name:
   AMY B. CERATO

2. Education
   B.S. Civil Engineering, Lafayette College, 1999
   M.S. Geotechnical Engineering, University of Massachusetts, 2001
   M.S. Geosciences, University of Massachusetts, 2004
   Ph.D. Geotechnical Engineering, University of Massachusetts, 2005

3. Academic experience –
   University of Oklahoma, Assistant Professor, School of Civil Engineering and
   Environmental Science, Norman, 2005-2010, Full-time

4. Non-academic experience
   Federal Highway Administration, Geotechnical Engineer, 2000 2004
   TerraTech Engineering, Geotechnical Engineer, 2000 - 2001
   Pietrzak and Pfau Engineering and Surveying PLLC, Civil Engineer, 1998

5. Certifications or professional registrations
   Licensed Professional Engineer, PE; Oklahoma License #23099

6. Current membership in professional organizations

7. Honors and awards
   2010 ASCE Arthur Casagrande Professional Development Award
   2009 Presidential Early Career Award for Scientists and Engineers (PECASE)
   2009 Rapp Foundation Presidential Professorship
   2009 Alumni Teaching Award (top 10% Fall ‘08 & Spring ‘09 course evaluations in OU CoE)
   2008 National Science Foundation (NSF) CAREER Award
   2008 George W. Tauxe Outstanding Professor Award (awarded by the OU-CEES students)
   2008 Graduate College Special Recognition for Outstanding Efforts in Graduate Recruiting
   2005 Junior Faculty Research Program Award
   2004 American Association for University Women (AAUW) Selected Professions Fellowship
   2004 Society of Women Engineers (SWE) Past Presidents Scholarship
   2004 UMass – Amherst Geotechnical Engineering Fellowship
   2003 Association for Women in Science (AWIS) Predoctoral Certification of Merit
   2002 Trent R. Dames and William W. Moore Fellowship (ASCE)
   2001 National Fraternity Graduate Fellowship
8. Service activities

a. **University:** Member: Provost’s Advisory Committee on Women’s Issues (PACWI); Graduate Enrollment Management (GrEM) Committee; Advisory Committee for the University Vice President of Research (AC/VPR);

b. **Department:** GeoInstitute (GI) Student Chapter Advisor; CEES Graduate Liaison and Graduate Studies Committee; Geotechnical Group WebMaster; Graduate Student Recruitment; Undergraduate recruitment; REU 2010; CE Capstone Advisory Board

c. **Professional:** Conference Session Organizer/Moderator: GeoInstitute GeoCongress including Student GeoCompetition Emcee + Technical Session; Session Organizer: GeoFlorida; Board Member: USUCGER; Member: ASCE GeoInstitute Committee on Engineering Geology and Site Characterization; Proposal and Manuscript Reviewer

9. Publications in the last 3 years (only Journal Papers included)


9. Presentations in the last 3 years (partial list)

- Diversity in the GeoProfession. *IFCEE09.* Orlando, FL (March 2009)
- Creating Excitement for the GeoProfession through Competition: GeoChallenge. *IFCEE09.* Orlando, FL (March 2009)

10. Professional Development Activities (partial list)

- Annual ASCE Geo-Institute’s GeoCongress’; Monthly Geotechnical Engineering Seminars

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1. NAME:
   CLIFF FITZMORRIS

2. EDUCATION:
   B.S., Electrical Engineering, University of Oklahoma, Norman, Oklahoma, 1988
   M.S., Electrical Engineering, University of Oklahoma, Norman, Oklahoma, 1995

3. ACADEMIC EXPERIENCE:
   University of Oklahoma, Instructor, School of Electrical & Computer Engineering, 2007 - present
   University of Oklahoma, Adjunct Instructor, School of Electrical & Computer Engineering, 1998 - 2007

4. NON-ACADEMIC EXPERIENCE:
   AT&T/Lucent Technologies, Member of Technical Staff, Telecom Circuit Design, 1995 - 2005
   AT&T/Lucent Technologies, Test Engineer, 5ESS Switch, 1988 - 1995.

5. CERTIFICATIONS or PROFESSIONAL REGISTRATIONS:
   Professional Engineer, Registered in the State of Oklahoma

6. CURRENT MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS:
   American Society of Engineering Educators (ASEE)

7. HONORS and AWARDS:
   IEEE-OU Student Branch Favorite Professor Award, 2007
   IEEE-OU Student Branch Favorite Professor Award, 2008
   IEEE-OU Student Branch Favorite Professor Award, 2009
   Brandon H. Griffith Outstanding Professor Award, 2008
   Brandon H. Griffith Outstanding Professor Award, 2010

8. SERVICE ACTIVITIES
   Within OU
   Faculty Advisor

   Outside OU
   None.

9. IMPORTANT PUBLICATIONS AND PRESENTATIONS (past 5 years)
   None

10. RECENT PROFESSIONAL DEVELOPMENT ACTIVITIES
    Illuminating Engineering Society of North America workshop, 2009
    Frontiers in Education Conference, 2009
    Frontiers in Education Conference, 2008
    Frontiers in Education Conference, 2007
1. Name:
   KIANOOSH HATAMI

2. Education
   Ph.D., 1997, Structural Engineering, McMaster University, Hamilton, ON, Canada
   M.Sc., 1991, Hydraulic Structures, Sharif University of Technology, Tehran, Iran
   B.Sc., 1987, Civil Engineering, Iran University of Science & Technology, Tehran, Iran

3. Academic experience
   University of Oklahoma, Associate Professor, CEES, 2011-Present, Full-time
   University of Oklahoma, Assistant Professor, CEES, 2004-2011, Full-time
   RMC and Queen’s University, Associate Research Director, GeoEngineering Center, 2003-2004, Full-time
   RMC and Queen’s University, Research Associate, 2000-2003, Full-time
   RMC and Queen’s University, Doctoral Fellow, 1997-1999

4. Non-academic experience
   Electrical Power Research Centre, Research Engineer, 1988 – 1989

5. Certifications or professional registrations
   P.Eng., Ontario (100016655)

6. Current membership in professional organizations
   Transportation Research Board of the National Academies (TRB) Geosynthetics (Geo-Institute), American Society of Civil Engineers, American Society for Testing and Materials (ASTM)

7. Honors and awards
   College of Engineering and Michael F. Price College of Business Alumni Teaching Award (OU) 2007, 2008, 2009
   Sir Casimir Gzowski Medal for Best Refereed Technical Paper (Canadian Society for Civil Engineering) 2006

8. Service activities
   a. College Level: FE Exam Review for COE/Tau Beta Pi (Twice a year, Since 2006)
   b. School Level: CEES Undergraduate Advising Committee (Since 2006); CEES Scholarships Committee (2010); Structural/Architectural Faculty Search Committees (2006, 2007)
   c. Professional Service:
      Technical Reviewer:
9. Publications in the last 5 years Partial list

Refereed Journal Publications:


10. Presentations in the last 5 years


2. Hatami K, 2010. ASCE Midwest Regional GeoCompetition at the University of Oklahoma. OSPE Central /SW Chapter Meeting, Oklahoma Society of Professional Engineers, May 2010, Oklahoma City, OK.


11. Professional Development Activities

1. Name:
   TAKUMI HAWA

2. Education
   B.S.  Aeronautical Engineering, Rensselaer Polytechnic Institute, 1994
   M.S.  Aeronautical Engineering, Rensselaer Polytechnic Institute, 1997
   Ph.D. Aeronautical Engineering, Rensselaer Polytechnic Institute, 1999

3. Academic experience –
   University of Oklahoma, Assistant Professor, School of Aerospace and Mechanical
   Engineering, 2008 – present, Full-time
   National Institute of Standards and Technology, Guest Researcher, Process
   Measurements Division, 2003 – 2008, Full-time
   University of Maryland, Research Associate, Department of Mechanical Engineering,
   2003 – 2008, Full-time
   University of Minnesota, Research Associate, Department of Mechanical Engineering,
   2001 – 2003, Full-time
   Institute for Mathematics and its Applications, Postdoctoral Fellow, 1999 – 2001, Full-
   time
   Rensselaer Polytechnic Institute, Postdoctoral Associate, Department of Mathematical
   Sciences, 1999 – 1999, Full-time

4. Non-academic experience

5. Certifications or professional registrations
   N/A.

6. Current membership in professional organizations
   Member, American Physical Society; Member, AIAA

7. Honors and awards
   The Michael A. Sadowski Prize by Department of Mechanical Engineering, Aeronautical
   Engineering and Mechanics in Rensselaer Polytechnic Institute (1998), Yamada

8. Service activities
   a. University Level: N/A.
   b. College Level: N/A.
   c. School Level: Member, Adhoc committee to implement strategic goals; Advisor,
      AIAA student organization; Advisor, Sigma Gamma Tau.
   d. Professional Service: Symposium Organizer, AIAA/ASME Oklahoma
      Symposium XXXI, Session Organizer/Chair, Multiscale/Multiphysics Modeling
      of Nanoscale Coating Mini-Symposium at the 11th US National Congress on
      Computational Mechanics.
e. **Community Service:** Faculty Advisor for a paper crafted glider contest for high-school students

9. **Publications in the last 5 years (partial list)**


**Presentations in the last 5 years (partial list)**


10. **Professional Development Activities:** N/A.
1. **Name:**
   YANG HONG

2. **Education**
   B.S. Geosciences, Beijing University, 1996
   M.S. Environmental Sciences, Beijing University, 1999
   PhD. Hydrology and Water Resources, College of Engineering, Univ. of Arizona, 2003

3. **Academic experience**
   University of Oklahoma, Associate Professor, School of Civil Engineering and Environmental Science, 2007 – 2011, Full Time
   University of Oklahoma, Adjunct Associate Professor, School of Meteorology, 2010 – 2011
   University of Oklahoma, Co-Director, WaTER Center (Water Technology for Emerging Regions), 2010 – 2011
   National Weather Center, Faculty Member, Atmospheric Radar Research Center 2008 – 2011
   University of California, Post-doctoral Researcher, Center for Hydrometeorology and Remote Sensing, College of Engineering, 2004 – 2005

4. **Non-academic experience**
   Goddard Earth Science and Technology Center at NASA Goddard Space Flight Center, Research Scientist, 2005 – 2007

5. **Certifications or professional registrations:**

6. **Current membership in professional organizations**
   Science Team Member, NASA Precipitation Measuring Mission, 2005~
   Member, American Geophysics Union, 2000~
   Member, American Meteorological Society, 2001~
   Member, International Association of Hydrological Sciences, 2002~
   Member, IEEE, 2006~

7. **Honors and awards**
   - **NOAA/OAR Scientific Fellow**, “to provide advice and guidance to NOAA/National Severe Storm Laboratory (NSSL) Director on matters concerning current operations or science initiatives”, 2010
   - **Oklahoma Space Grant Consortium/NASA EPSCoR RIG Award**, 2009/2010
   - **NASA Group Achievement Award**: “For significant achievements in systematically promoting and accelerating the use of NASA scientific research results for societal benefits”, awarded by NASA Headquarter Administrator on May 8th, 2008
   - **Faculty Career Development Award** for Research Fellows, University of California Irvine Academic Senate, 2005
   - **Outstanding Public Service Award**, Chinese Consulate General at Los Angeles, 2005
   - **The Mayor Award** for Outstanding International Student, City of Tucson, Arizona, 2002
• **Outstanding Academic Honor** for Top 10 Graduate Students of 1999, Peking University, China, 1999

• **Challenge Cup**, Young Scientist Award, Peking University, China, 1998

• "**Baichuan" Award**, School of Earth Sciences, Peking University, China, 1996

8. **Service activities**
   
a. **University Level**: Member, University Strategy Organization ARRC and CAPS

b. **College Level**: Co-director, WaTER Center

c. **School Level**: Liaison/Member, University Library; …

d. **Professional Service**: Editor, International Journal of Remote Sensing; Reviewer or Panelist, NSF, NOAA, NASA, DOT, and European Space Agency; Chair, American Geophysical Union Hydrology Section Precipitation Committee

e. **Community Service**: Volunteer for Food Bank Drive

9. **Publications in the last 5 years**

   **Summary**: Dr. Hong has published more than 90 peer-reviewed publications (60+ journal articles, 19+ books or book chapters, and 15+ refereed proceedings) and more than 100 scientific conference abstracts in last five years. Dr. Hong has also released 8 Technology Disclosures to universities, federal governmental agency, and private companies.

   Principal developer of the satellite retrieval algorithm: PERSIANN-CCS;

   Principal developer of the NASA Global Hazard Alert System;

   Principal developer of High-resolution Distributed OU-NASA CREST hydrological model and physical-based OU SLIDE storm-induced landslide model


10. **Professional Development Activities**

   • Participant and Mentor, **Creating Critical Connection in Math and Science Summer Workshop**, organized by OU College of Engineering, 2009 June 1-14; 2011 June 6-17

   • Faculty Workshop on **Active and Cooperative Learning in STEM Classrooms** by The Sooner Engineering Education (SEED) Center, January 2011

   • Participant and Mentor, Creating Critical Connection in Math and Science Summer Workshop, organized by OU College of Engineering, 2009 June 1-14; 2011 June 6-17
1. **Name:**
   THOMAS KANG

2. **Education**
   - B.S. Architecture, Seoul National University, 1998
   - M.S. Civil Engineering, Michigan State University, 2000
   - Ph.D. Civil Engineering, University of California at Los Angeles, 2004

3. **Academic experience**
   - University of Oklahoma, Assistant Professor, School of Civil Engineering and Environmental Science, 2011 – 2007, Full-time
   - University of California at Los Angeles, Lecturer, Department of Civil and Environmental Engineering, 2007 – 2004

4. **Non-academic experience**
   - John A. Martin & Assoc., Consulting Engineer, 2007 – 2004

   - **Certifications or professional registrations**
     - P.E., California (71385)

5. **Current membership in professional organizations**
   - American Society for Civil Engineers (ASCE), American Concrete Institute (ACI), Precast/Prestressed Concrete Institute (PCI), Member, Post-Tensioning Institute (PTI)

6. **Honors and awards**
   - Wason Medal for Most Meritorious Paper (2009) by the American Concrete Institute,
   - Award of Excellence (2009) by Precast/Prestressed Concrete Institute,

7. **Service activities**
   - **University Level:** Member, Faculty Search Committee for Construction Science
   - **College Level:** Member, Faculty Search Committee for Architectural Engineering
   - **School Level:** Faculty Advisor, Architectural Engineering Student Chapter; Member, Donald G. Fears Laboratory Oversight Committee
   - **Professional Service:** Editorial Board, International Journal of Systems Theory; Secretary, Joint ACI-ASCE Committee 352; Voting Member, ACI Committee 369; Voting Member, ACI Collegiate Concrete Council; ACI Committee 335; Voting Member, PTI Committee DC-20

8. **Publications in the last 5 years (partial list)**


9. Presentations in the last 3 years (partial list)


10. Professional Development Activities
Co-Host, 2011 Oklahoma Transportation Center Summer Symposium, July, 2010
1. **Name:**
   TOHREN C.G. KIBBEY

2. **Education**
   - Ph.D. Environmental Engineering, University of Michigan, 1997
   - M.S.E. Environmental Engineering, University of Michigan, 1993
   - B.S.E. Mechanical Engineering, summa cum laude, University of Michigan, 1991

3. **Academic experience**
   - University of Oklahoma, Professor, School of Civil Engineering and Environmental Science, 2010-present, Full-time
   - University of Oklahoma, Associate Professor, School of Civil Engineering and Environmental Science, 2005-2010, Full-time
   - University of Oklahoma, Assistant Professor, School of Civil Engineering and Environmental Science, 1999-2005, Full-time

4. **Non-academic experience**
   None.

5. **Certifications or professional registrations**
   None.

6. **Current membership in professional organizations**
   - American Geophysical Union (AGU)
   - American Chemical Society (ACS)

7. **Honors and awards**
   - University of Oklahoma Good Teaching Award, 2009
   - Alumni Teaching Award, awarded for CEES 1213 Computing Applications in CEES, Fall 2008
   - Alumni Teaching Award, awarded for CEES 2223 Fluid Mechanics, Spring 2008
   - Alumni Teaching Award, awarded for CEES 2223 Fluid Mechanics, Spring 2007
   - National Science Foundation CAREER Award, “Surfactant Mixtures in Complex Environmental Systems,” Awarded 2001
   - Junior Faculty Research Program Award, University of Oklahoma (2003)
   - Junior Faculty Research Program Award, University of Oklahoma (2001)

8. **Service activities**
   - **University:** Teach Test Panelist; Graduate College Academic Misconduct Committee; Graduate College Appeals Committee
   - **College:** CoE Academic Misconduct Committee; CoE Appeals Committee
   - **School:** Committee A Member; Chair, CEES Advising Committee; CoE Liaison to Student Advising

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9. Publications in the last 5 years


1. Name:

ROBERT CHARLES KNOX, Ted A. Kritikos Chair and Director

2. Education

P.E., 1987, Principles and Practice of Engineering
EIT, 1984, Engineering in Training
Ph.D., 1983, Civil Engineering, University of Oklahoma, Norman, OK
M.S., 1979, Civil Engineering, University of Oklahoma, Norman, OK
B.S., 1978, Civil Engineering with Distinction, University of Oklahoma, Norman, OK

3. Academic experience

University of Oklahoma, Professor, Ted A. Kritikos Chair and Director, Civil Engineering and Environmental Science, 2006 – present, Full-time
University of Oklahoma, Professor, John A. Myers Professor and Director, Civil Engineering and Environmental Science, 2000 – 2006, Full-time
University of Oklahoma, Professor, Samuel Roberts Noble Presidential Professor, Civil Engineering and Environmental Science, 1998 – 2000, Full-time
University of Oklahoma, Professor, Civil Engineering and Environmental Science, 1997 – 1998, Full-time
University of Oklahoma, Associate Professor, Civil Engineering and Environmental Science, 1992 - 1997
University of Oklahoma, Assistant Professor, Civil Engineering and Environmental Science, 1986 - 1992
McNeese State University, Assistant Professor, Department of Civil Engineering, 1984 – 1986, Full-time
University of Oklahoma, Environmental Engineer, Environmental and Ground Water Institute, 1983 – 1984, Full-time

4. Non-academic experience

Surbec Environmental, LLC, Co-founder and Principal, 1999-present, Part time,

5. Certifications or professional registrations - Oklahoma (14903), Louisiana (22283)

6. Current membership in professional organizations - American Society of Civil Engineers, American Society for Engineering Education, National Society of Professional Engineers, Association of Ground Water Scientists and Engineers, Association of Environmental Engineering Professors, American Geophysical Union, Oklahoma Society of Professional Engineers

7. Honors and awards - NSPE Engineering Education Excellence Award, 2000; Samuel Roberts Noble Presidential Professor, 1998; College of Engineering Distinguished Lectureship Award, 1997; Fred Merryfield Design Award, American Society for Engineering Education, 1996; MAPCO Engineering Lectureship Award, OU College of Engineering, 1994; Outstanding Young Engineer of the Year Award, Oklahoma Society of Professional Engineers, 1990; OU Associates Distinguished Lectureship, 1988-89; Outstanding Young Man of America, 1987; DOW Outstanding Young Faculty Award, Gulf-Southwest Section ASEE, 1986
8. Service Activities

University: Medal of Excellence nomination package for Provost Mergler to submit; coordinated university Alpha time on water and sanitation.

College: Faculty Advisor for Engineers Without Borders (Regional Workshop, fundraising events, two assessment trips), WaTER Center committee, ABET Assessment Committee, CoE Dean Evaluation Committee, Greg Mortenson Planning Committee

Department: Director
- General – Faculty evaluations, unit evaluation, faculty retreat, revamped CEES Strategic Plan, revised Visiting Council By-laws, conducted two Visiting Council meetings, met with all prospective students in architectural, civil, environmental engineering and environmental science, advised all transfer students
- Academic – Developed all materials for immediate revisit from ABET, revised AE curriculum in order to meet ABET requirements, AE program accredited until 2011, developed Memorandum of Agreement with Water For People for internships.
- Publications – One journal publication, three Program Outcomes Assessment Reports; CEES Communique’ – A Newsletter for Alumni and Friends; Unit Evaluation – 2009, ABET Immediate Revisit Report
- Nominations – One national Award (WERF), one state award (Medal of Excellence), three campus awards (one David Ross Boyd, one Presidential Professor, one Outstanding Teaching), one CAREER letter, three Fellowship reference letters, twelve reference letters for Doctoral students, reference letters for three undergraduate scholarship applications.
- Personnel – Three promotion dossiers, five progress toward tenure evaluations; paid for Fitzmorris to attend IES Lighting Workshop

9. Publications and presentations from the past five years
- “Program Outcomes Assessment Report for Civil Engineering, 2009-10”, submitted to Vice Provost for Instruction, September 15, 2010
- “CEES Unit Evaluation – 2010”

10. Professional Development Activities - ASCE National Department Heads Meeting
1. **Name:**
   RANDALL L. KOLAR

2. **Education**
   - B.S.  Civil Engineering, University of Idaho, 1983
   - B.S.  Mathematics, University of Idaho, 1983
   - Ph.D.  Civil Engineering, University of Notre Dame, 1992

3. **Academic experience**
   - University of Oklahoma, Professor, Austin Presidential Professor, School of Civil Engineering and Environmental Science, 2008 – Present, Full-time
   - University of Oklahoma, Professor, School of Civil Engineering and Environmental Science, 2007 – 2008, Full-time
   - University of Oklahoma, Associate Professor, School of Civil Engineering and Environmental Science, 2001 – 2007, Full-time
   - University of Oklahoma, Assistant Professor, School of Civil Engineering and Environmental Science, 1995 – 2001, Full-time
   - University of New Haven, Assistant Professor, Department of Civil and Environmental Engineering, 1993 – 1995, Full-time
   - University of New Haven, Adjunct Professor, Department of Civil and Environmental Engineering, 1992 – 1993, Part-time

4. **Non-academic experience**
   - JUB Consulting Engineers, Project Engineer, 1983 – 1987

5. **Certifications or professional registrations**
   - P.E., Oklahoma (22724) and Idaho (6034)

6. **Current membership in professional organizations**
   - American Geophysical Union, American Society of Civil Engineers, American Society for Engineering Education, American Water Resources Association, Society of Industrial and Applied Mathematics, Tau Beta Pi

7. **Honors and awards**

8. **Service activities**
   - **University Level:** Member - IT Committee, President’s Graduation and Retention Task Force, Faculty Senate; TSI (Teaching Scholars) Steering Committee.
   - **College Level:** Member - IT Committee.
c. **School Level:** Associate Director, WaTER Center; Chair - IT Committee; Member - Undergraduate Curriculum Committee.

d. **Professional Service:** Associate Editor - *Computational Geosciences and Advances in Water Resources*; Advisor Board - NRL and GRDA (Grand River Dam Authority); Steering Committee - DHS Center of Excellence.

9. **5 Publications in the last 1 year**


5 **Presentations in the last 1 year**


10. **Professional Development Activities**

Workshop on Instructional Design (Facilitator), Tennessee Tech. University, August 5-6, 2010; ADCIRC Model Workshop, Stennis Space Center, MS, April 18-19, 2010.
1. Name
FENG C. LAI

2. Education
Ph.D., 1988, Mechanical Engineering, University of Delaware
M.S., 1985, Mechanical Engineering, University of Delaware
B.S.1978, Power Mechanical Engineering, National Tsing-Hua University, Taiwan

3. Academic experience
University of Oklahoma, Professor, School of Aerospace and Mechanical Engineering, University of Oklahoma, 2009 – Present, Full-time.
University of Oklahoma, Associate Professor, School of Aerospace and Mechanical Engineering, University of Oklahoma, 1998 – 2009, Full-time.
University of Oklahoma, Assistant Professor, School of Aerospace and Mechanical Engineering, 1992 – 1998, Full-time.
Colorado State University, Instructor (Non-tenure track), Department of Mechanical Engineering, 1990 – 1992

4. Non-academic experience
Colorado State University, Research Associate, 1986 – 1992

5. Certifications or professional registrations
N/A

6. Current membership in professional organizations
Associate Fellow, American Institute of Aeronautics and Astronautics (AIAA), Fellow, American Society of Mechanical Engineers (ASME), Member, American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)

7. Honors and awards
Associate Fellow, American Institute of Aeronautics and Astronautics (AIAA), 2006. Fellow, American Society of Mechanical Engineers (ASME), 2006.

8. Service activities
   b. College Level: N/A
e. Community Service: Board Member, American Red Cross Heart of Oklahoma Chapter, Volunteer, American Red Cross disaster action team.

9. Publications in the last 5 years


10. Professional Development Activities
COSMOS FloWorks Training, MLC CAD Systems, Stillwater, OK, 02/22-02/23/07; NSF Workshop for Frontiers in Transport Phenomena Research & Education: Energy Systems, Biological Systems, Security, Information Technology & Nanotechnology, 2007; Mini-Workshop on Engineering and Science Education in Collaboration with Sandia National Labs, 2007; Sabbatical leave: National Taiwan University of Science and Technology (08/08-12/08), National Taiwan University (01/09-06/09).
1. Name:
WILSON MERCHAN-MERCHAN

2. Education
B.S. Mechanical Engineering, University of Illinois at Chicago, 1998
M.S. Mechanical Engineering (Combustion), University of Illinois at Chicago, 2000
Ph.D. Materials Engineering (Nanotechnology and Combustion), University of Illinois at Chicago, 2005

3. Academic experience
University of Oklahoma, Assistant Professor, School of Aerospace and Mechanical Engineering, 2006-2011
University of Illinois at Chicago, Visiting Scientist/Postdoctoral, 2005-2006,
University of Illinois at Chicago, Teaching/Research Assistant, 1998 - 2005

4. Current membership in professional organizations
Combustion Institute, Member
American Chemical Society, Member
Journal of Nanomedicine & Nanotechnology (JNMNT), Editorial Board Member
American Nano Society (ANS), Member
Oklahoma Microscopy Society (OMS), Member

5. Selected honors and awards

6. Service activities
a. School level: Member of Student Group Advisor -- Pi Tau Sigma, Mechanical Engineering
Honor Society (OU PTS Chapter is nationally considered in good standing). Advisor, 2006 to present.

b. School level: Undergraduate Committee Member (2007 to present)

c. University level: Panelist in the Teach Test in the Graduate College English Assessment Program

7. Selected publications in the last 5 years
Saveliev. “Increasing the Solar Cell Power-Output by Coating with Transition Metal-

W. Merchan-Merchan, A.V. Saveliev, W. Cuello Jimenez. “Solid support flame synthesis
of 1-D and 3-D tungsten-oxide nanostructures” *33rd Proc. Combust. Inst*, 33, pp. 1899-
1908, 2011.

Hybrid Nanowires with Carbon Shells and Tungsten-Oxide Cores” *Carbon*, 48, pp. 4510-
4518, 2010.

“Combustion Synthesis of Carbon Nanotubes and Related Nanostructures” *Journal of

Method for Synthesis of Metal-Oxide Channels, Nanowires, and Nanorods” *Journal of

8. Selected presentations in the last 5 years

synthesis of transition metal-oxide nanostructures on solid supports” *7th US National
Technical Meeting of the Combustion Institute*. Georgia Institute of Technology, Atlanta,

Merchan-Merchan, A.V. Saveliev, W. Cuello Jimenez. “Volumetric flame synthesis of
tungsten oxide octahedron nanoplatelets and rod-like structures” *7th US National
Technical Meeting of the Combustion Institute*. Georgia Institute of Technology, Atlanta,

W. Merchan-Merchan and S. Granados Sanmiguel. “Soot Morphology and Nanostructure
in Biodiesel and Diesel Fuel Air Flames” *7th US National Technical Meeting of the

W. Merchan-Merchan, A.V. Saveliev, W. Cuello Jimenez. “Solid support flame synthesis
of 1-D and 3-D tungsten-oxide nanostructures” *33rd Proc. Combust. Inst*. Tsinghua
University, Beijing China, August 1-6, 2010.

9 Professional development activities

Occasionally serves as a reviewer of Proposals for NSF.

Reviewer for Carbon, JNanoparticle Research, ASME, Journal of Nanoscience and
Nanotechnology, Materials Chemistry and Physics, Materials Science and Engineering B,
Nanotechnology, and among others.
1. **Name:**
   GERALD A. MILLER

2. **Education**
   B.S. Civil and Environmental Engineering, Clarkson University, 1985
   M.S. Civil and Environmental Engineering, Clarkson University, 1987
   Ph.D. Civil and Environmental Engineering, University of Massachusetts – Amherst, 1994

3. **Academic experience**
   University of Oklahoma, Professor, School of Civil Engineering and Environmental Science, 2007 – Present, Full-time
   University of Oklahoma, Associate Professor, School of Civil Engineering and Environmental Science, 2000 – 2007, Full-time
   University of Oklahoma, Assistant Professor, School of Civil Engineering and Environmental Science, 1984 – 2000, Full-time

4. **Non-academic experience**
   Geotechnical Engineering Consultant, 1994 – Present
   H&A of New York (Haley and Aldrich), Assistant Engineer II & III, 1989 – 1991

5. **Certifications or professional registrations**
   Professional Engineer in Oklahoma, 1996, P.E. No. 18088.

6. **Current membership in professional organizations**
   Secretary, TC106 ISSMGE Committee on Unsaturated Soils
   Member, ASCE Technical Committee on Unsaturated Soils
   Member, TRB Committee AFP60 on Engineering Behavior of Unsaturated Soils

7. **Honors and awards**
   Chi Epsilon Civil Engineering Honor Society, 1986.
   Canadian Valley Chapter of the Oklahoma Society of Professional Engineers 1997 Young Engineer of the Year.
   1998 George W. Tauxe Outstanding Professor Award given by student chapter of ASCE and Chi Epsilon.
   2009 George W. Tauxe Outstanding Professor Award given by student chapter of ASCE and Chi Epsilon.

8. **Service activities**
   a. **University Level:**
   b. **College Level:** Represent CoE on the Oklahoma Transportation Center Research Committee.
   c. **School Level:** Member, Committee A; Member, Graduate Studies Committee
   d. **Professional Service:** Editorial Board Member, ASTM Geotechnical Testing Journal; Secretary, ISSMGE TC106 Committee on Unsaturated Soils; Member ASCE Geo-Institute Conference Coordination Committee (Board Level Committee); Review papers for numerous journals.
9. **Publications in the last 5 years (Journals Only)**


**Presentations in the last 5 years**


10. **Professional Development Activities**

Have attended the last five(+) ASCE Geo-Institute Annual Meetings including the most recent, “GeoFrontiers” in Dallas, TX, March 2011; Attend the 5th International Conference on Unsaturated Soils, “UNSAT 2010” in Barcelona, Spain, September 2010; Attended the 1st European Conference on Unsaturated Soils, “E-UNSAT 2008” in Durham, UK, July 2008; Attended the 3rd International Conference on Site Characterization in Taipei, Taiwan, April 2008.
1. Name:
K.K. “MURALEE” MURALEETHARAN

2. Education
   B.S.  Civil Engineering, University of Peradeniya, Sri Lanka  1983
   M.S.  Civil Engineering, University of California, Davis  1987
   Ph.D. Civil Engineering, University of California, Davis  1990

3. Academic experience –
   University of Oklahoma, Professor, David Ross Boyd Professor, Kimmell-Bernard Chair in Engineering, School of Civil Engineering and Environmental Science, 2005 – Present, Full-time
   University of Oklahoma, Associate Professor, School of Civil Engineering and Environmental Science, 2000 – 2005, Full-time
   University of Oklahoma, Assistant Professor, School of Civil Engineering and Environmental Science, 1994 – 2000, Full-time
   University of California, Irvine, Lecturer, Department of Civil Engineering, 1993 – 1994, Part-time

4. Non-academic experience
   Earth Tech, Senior Project/Project/Senior Staff/Staff Engineer, 1988 – 1994

5. Certifications or professional registrations
   P.E. (California, since 1992, C 49464)
   Geotechnical Engineer (California, since 2002, GE 2566)

6. Current membership in professional organizations
   Fellow, American Society of Civil Engineers (ASCE); Member, International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE); Member, American Society for Engineering Education (ASEE)

7. Honors and awards
   College of Engineering Alumni Teaching Award (Spring 2009, Fall 2008)
   George W. Tauxe Outstanding Civil Engineering Professor (2005, awarded by students), President’s Associates Presidential Professorship (2005)
   Williams Faculty Innovator Award (as a part of the Sooner City Faculty Team
   Oklahoma State Regents for Higher Education, 2000)
   Regents' Award for Superior Teaching (2000)
   National Science Foundation CAREER Award (1995)
   Earth Technology Corporation’s Corporate Quality Award for Excellence (1992)

8. Service activities
   a. University Level: Faculty Senate Executive Committee; Chair, Faculty Compensation Committee; Retirement Plans Management Committee.
   b. College Level: Representative to the Faculty Senate.
c. **School Level:** Undergraduate Curriculum Committee.

d. **Professional Service:** ASCE, Geo-Institute, Soil Properties and Modeling and Unsaturated Soils Committees; ASCE, Engineering Mechanics Division, Poromechanics Committee.

e. **Community Service:** Oklahoma School of Science and Mathematics (OSSM) interview panel.

9. **Publications in the last 5 years**


10. **Professional Development Activities**

Workshop on Designing Courses for Significant Learning, Tennessee Tech, August 5-6, 2010: Assisted the workshop leader Dr. Dee Fink.
1. **Name:**
   JIN-SONG PEI (JINSONG PEI)

2. **Education**
   B.Eng. Structural Engineering, Xi’an Jiaotong University, P.R. China, 1989
   M.Eng. Structural Engineering, Nanyang Technological University, Singapore, 1997
   M. Phil., Civil Engineering and Engineering Mechanics, Columbia University, NY, 2000
   Ph.D., Civil Engineering and Engineering Mechanics, Columbia University, NY, 2001

3. **Academic experience**
   University of Oklahoma, Associate Professor (with tenure), CEES, 2008 – Present, Full-time
   University of Oklahoma, Graduate Faculty Member (M3 status), ECE, 2005 – Present
   Duke University, Visiting Faculty, CEE, Duke University 2009 – 2010 (part of sabbatical leave)
   Caltech, Visiting Research Associate, CE, 2009 – 2010 (part of sabbatical leave)
   University of Oklahoma, Assistant Professor, CEES, 2002 – 2008 – Full-time
   Columbia University, Research Assistant and Teaching Assistant, CEEM, 1998 – 2001
   Nanyang Technological University, Teaching Assistant, CSE, 1994 – 1996

4. **Non-academic experience**
   Weidlinger Associates Inc. Engineer, 2002 – 2002
   Indeco Consultants, Civil/Structural Engineer, 1996 - 1998
   Construction & Development Corporation, Division of Real Estate, Project Executive/Assistant Engineer, 1989 – 1994

5. **Certifications or professional registrations** N.A.

6. **Current membership in professional organizations**
   ASCE, ACM, INNS, SPIE, NEES Consortium, SEM, EERI

7. **Honors and awards**
   - ASCE Excellence in Civil Engineering Education (ExCEEd) Fellowship, 2007
   - Junior Faculty Research Program Recipient, the Vice President for Research, University of Oklahoma, 2004 & 2006
   - First Recipient of the “Excellent Teaching Assistant Award”, Department of Civil Engineering & Engineering Mechanics, Columbia University, 1999
   - Recipient of Outstanding Student Award, Department of Structural Engineering, Xi’an Jiaotong University, 1985-1989

8. **Service activities**
   a. **University Level:** K20 Faculty Fellow, OU
   b. **College Level:** N.A.
   c. **School Level:** Member, Committee A; Graduate Studies Committee
   d. **Professional Service:** Reviewer, National Science Foundation; Reviewer, more than 10 technical journals; Session Chair/Co-Chair, ASCE EMI, SPIE, IMAC, etc.
e. **Community Service:** N.A.

9. **Publications in the last 5 years** (The students’ names are underlined.)
  “Experimental and code analyses for shear design of AASHTO prestressed concrete girders”, 
  “Linking system identification to nonlinear dynamic simulation under OpenSees - some 
  justifications and implementations”, Piyawat, K., and **Pei, J.S.**, *ASCE Journal of 
  “Embedded algorithms within an FPGA to classify nonlinear single-degree-of-freedom 
  systems”, Jones, J.D., and **Pei, J.S.**, *IEEE Sensors Journal – Special Issue on Sensor 
  Systems for Structural Health Monitoring*, 9(11), 1486-1493, November 2009
  “An experimental investigation of applying Mica2 Motes in pavement condition 
  Systems and Structures*, 20, 63-85, January 2009
  “Constructing multilayer feedforward neural networks to approximate nonlinear functions in 
  Mechanics*, 75, November 2008
  “An experimental investigation of the data delivery performance of wireless sensing units 
  composed of off-the-shelf components for structural health monitoring”, **Pei, J.S.**, 
  “Deterministic excitation forces for simulation and identification of nonlinear hysteretic 
  134(1), 35-48, 2008
  “An FPGA-based smart wireless sensing unit for structural health monitoring”, Kapoor, C., 
  Graves-Abe, T.L., and **Pei, J.S.**, an invited paper to *Smart Structures and Systems*, 
  Techno Press, 3(1), 69-88, 2007
  “A new approach to designing multilayer feedforward neural network architectures for 
  modeling nonlinear restoring forces: Part II - Applications”, **Pei, J.S.**, and Smyth, A.W., 
  “A new approach to designing multilayer feedforward neural network architecture for 
  modeling nonlinear restoring forces: Part I - Formulation”, **Pei, J.S.**, and Smyth, A.W., 

**Presentations in the last 5 years**
At ASCE EMI, SPIE, IMAC, ANCRisST, 5WCSCM, IJCNN, and at UCSD, Caltech, USC, etc.

10. **Professional Development Activities**
Caltech AM 125a, 125b, 125c, CDS 140 and CDS 202, Fall 2009 to Spring 2010
*Fast Hybrid Testing for Researchers and Development Engineers*, UC Boulder, 2006
*MR Damper FHT Workshop*, the UC Colorado NEES facility, Boulder, CO, 2007
Xilinx Customer Education Class and Professor Workshop, 2004, 2007 (three times)
1. Name:
BABUR MUSTAFA PULAT

2. Education:
Ph.D, 1980, Industrial Engineering, North Carolina State University at Raleigh, N.C.
M.S., 1975, Industrial Engineering, Middle East Technical University, Ankara, Turkey
(with Honors).
B.S., 1974, Industrial Engineering, Middle East Technical University, Ankara, Turkey
(with Honors).

3. Academic experience:
University of Oklahoma, Adjunct Professor, School of Industrial Engineering, 1994 - present
University of Oklahoma, Adjunct Associate Professor, School of Industrial Engineering, 1985 - 1994
Oklahoma City University, Adjunct Professor, Meinders Business School, 2001 - present
University of Central Oklahoma, Adjunct Professor, Business School, 2003 - present
University of Oklahoma, Associate then Full Director, CELDi (Center for Engineering Logistics and Distribution. NSF (National Science Foundation) I/UCRC (Industry/University Cooperative Center), 2002 - Present
North Carolina A&T State University, Associate Professor, Department of Industrial Engineering, 1983 - 1985
North Carolina A&T State University, Assistant Professor, Department of Industrial Engineering, 1979 - 1983

4. Non-academic experience:
Creative Insights, LLC, Vice President and Chief Technical Officer, 2001 - Present
Lucent and AT&T, Technical Manager, 1989 - 2001
AT&T Technologies, Senior Engineer, 1988 - 1989
AT&T Technologies, Planning Engineer, 1985 - 1988

5. Certifications or professional registrations:
Lean/Six Sigma Master Black Belt

6. Current membership in professional organizations: N/A

7. Honors and awards:
Alpha Pi Mu, Tau Beta Pi
IIE Greensboro Senior Chapter 163 Service Award, 1985

8. Service activities:
Alpha Pi Mu Faculty Advisor, North Carolina A&T State University, Greensboro, NC., 1982 - 1985
Graduate Program Administrator, North Carolina A&T State University, Greensboro, NC., 1981 - 1982
IIE Faculty Advisor, North Carolina A&T State University, Greensboro, NC., 1981 - 1982

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9. **Briefly list the most important publications and presentations:**

Books Published: Three; two of which are edited books with about a third of each self-authored. One fully authored by self.
Book Chapters/Journal Publications: Thirty-three.
Proceedings Pub./Professional Present./Tech. Reports: Forty seven

10. **Briefly list the most recent professional development activities:**
Site Director: NSF CELDi Industry/University Cooperative Research Center.
Lean/Six Sigma Master Black Belt Certification.
1. **Name:**
PAKIZE SIMIN PULAT

2. **Education:**
PhD, 1984, Operations Research, North Carolina State Univ., Raleigh, NC.

3. **Academic experience:**
University of Oklahoma, Suzanne and Howard Kauffman Chair, Associate Dean of Undergraduate Education, 2007-present
University of Oklahoma, John A. Myers Professor, Associate Dean of Undergraduate Education, 2006-2007
University of Oklahoma, Professor of Industrial Engineering, Director, 2001-2006
University of Oklahoma, Professor of Industrial Engineering, 1996-2001 (1997-1998 as Interim Director)
University of Oklahoma, Associate Professor, Industrial Engineering, 1991-1996
University of Oklahoma, Assistant professor, 1985-1991
North Carolina A&T State University, Assistant Professor, 1980-1985
Bennett College, Mathematics, Part-time Instructor, 1979

4. **Non-academic experience:**
Creative Insights, CEO, 2005-present
Creative Insights, VP and COO, 2002-2005

5. **Certifications or professional registrations:** NA

6. **Current membership in professional organizations:**
Fellow, Institute of Industrial Engineers
Senior Member, Institute of Operations Research and Management Science
Member, American Society of Engineering Education

7. **Honors and awards:**
IIE Fellow, Institute of Industrial Engineers, May 2004.
Outstanding Professor in Industrial Engineering *(voted by students)*, University of Oklahoma, 2001.
Engineering Excellence Award, College of Engineering, Univ. of Oklahoma, 1996.
Distinguished Lecturer Award, College of Engineering, University of Oklahoma, 1993-1994.
Faculty Development Award, University of Oklahoma, Spring 1988.
IIE Greensboro Senior Chapter 163 Service Award, 1985

8. **Service activities:**
Member, Board of Advisors for the Pre-Engineering Programs at Moore-Norman Career Tech and Francis Tuttle Career Tech, 2007- present.
CAREER Grant Proposal Review Panel Member, National Science Foundation, November, 2000, 2002.

University Level:
Co-Chair, Study Abroad in the Middle East, 2009- present
Engineering Transfer Equivalency Committee, 2008-present
Provosts Advisory Committee on Written Communication, 2009-present
Provosts Advisory Committee on General Education Courses, 2008-present
Employee Welfare and Benefits Committee, 2007- present
Program Review Committee, 2007
University Accreditation Committee
Panel Member, Research Funding, New Faculty Colloquium, 2003

9. Briefly list the most important publications and presentations from the past five years:

10. Briefly list the most recent professional development activities:
Active and Cooperative Learning Workshop by Richard Felder at the University of Oklahoma, January 2011.
1. Name:
   CHRISTOPHER C. E. RAMSEYER

2. Education
   B.S., Civil Engineering, University of Oklahoma, 1998
   M.S., Civil Engineering, University of Oklahoma, 1999
   Ph.D., Civil Engineering, University of Oklahoma, 2006

3. Academic experience –
   University of Oklahoma, Director Donald G. Fears Structural Engineering Laboratory, and
   Assistant Professor, School of Civil Engineering and Environmental Science, 2011 – 2008,
   Full time
   University of Oklahoma, Assistant Professor, School of Civil Engineering and
   Environmental Science, 2006 – 2008, Full time
   University of Oklahoma, Adjunct Professor, School of Civil Engineering and Environmental
   Science 2000 – 2005, Part time

4. Non-academic experience
   Senior Design Engineer, Star Building Systems, 1999 – 2003, Full time
   Owner and Manager, Canyon Park Apartments, 1978 – 1994, Full time

5. Certifications or professional registrations
   P.E., California (C61767) and Oklahoma (20860)

6. Current membership in professional organizations
   Structural Stability Research Council, (SSRC), American Iron and Steel Institute, (AISI),
   American Society of Engineering Educators, (ASEE), American Concrete Institute, (ACI),
   American Institute of Steel Construction, (AISC), Oklahoma Society of Structural Engineers,
   (OSA), American Society of Civil Engineers, (ASCE),

7. Honors and awards
   Alumni Teaching Award, OU College of Engineering, Fall 2007
   George W. Tauxe, Outstanding Professor Award (awarded by the OU-CEES students), 2004

8. Service activities
   a. University Level: Member CoA/CoE Council, EPF-COE Task Force, Expansion of
      Fears Lab
   b. College Level: Advisor to LKOT and E-Club
   c. School Level: Member, Undergraduate Committee; Advisor to ASCE, Concrete
      Canoe, Steel Bridge competition team, Coordinator, ASCE regional conference.
   d. Professional Service: Member AISI Committee on Specification and 3 sub
      committee’s, Member ACI Committee 223, Coordinator and Moderator for ACI 223
      technical session
   e. Community Service: Extreme Home Makeover, build 270’ Morgan Park Bridge
9. Publications in the last 5 years


Whittle, J. and Ramseyer, C.C., " Buckling Capacities of Axially Loaded, Cold-Formed, Built-Up C-Channels" Thin-Walled Structures, Elsevier Vol. 47 February 2009, pp. 190-201, ISSN 0263-8231

Presentations in the last 5 years

Ramseyer, C.C., "Investigation of the Dimensional Stability of Concrete Slabs on Grade at the Advanced Concrete Research Laboratory", American Concrete Institute, Annual Fall Convention, St. Louis, Missouri, November 2009

Ramseyer, C.C., Piyawat, K., "Numerical Buckling Analysis of Built-Up, Cold Formed Members", American Iron and Steel Institute, Committee on Specification, Charlotte, North Carolina, August 2009

Ramseyer, C.C. and Perez, V., "Highway Panel Replacement – CSA Concrete in California", Concrete Pavement Technology Program, Federal Highway Administration, National Conference on Preservation, Repair and Rehabilitation of Concrete Pavements, St Louis, Missouri April 2009

10. Professional Development Activities
Workshop on Active and Cooperative Learning by Richard Felder, Sooner Engineering Education Center, University of Oklahoma, January 28, 2010;
1. **Name:**
   DAVID A. SABATINI

2. **Education**
   - Ph. D.  Civil Engineering  Iowa State University  1989
   - M. S.  Civil Engineering  Memphis State University  1985
   - B. S.  Civil Engineering  University of Illinois  1981

3. **Academic experience** –
   - University of Oklahoma, Professor, David Ross Boyd Professor, Director, WaTER Center, 1999 – Present, Full time
   - Universität Tübingen, Senior Fulbright Scholar, 1997 - 1998
   - University of Oklahoma, Associate Professor, 1994 – 1999, Full time
   - University of Oklahoma, Assistant Professor, 1989 – 1994, Full time

4. **Non-academic experience**
   - Surfactant Associates, Inc, Partner, 2000 - Present
   - USEPA Environmental Research Laboratory Summer 1997
   - Surbec Environmental, LLC, co-Founder and co-Principal, 1996 – 2008

5. **Certifications or professional registrations**
   - PE: Oklahoma – 17121; Tennessee - 0107663

6. **Current membership in professional organizations**
   - American Chemical Society, American Geophysical Union, American Oil Chemists Society, American Society of Civil Engineers, American Society of Engineering Educators, American Water Works Association, Association of Environmental Engineering and Science Professors (AEESP), International Water Association, National Ground Water Association

7. **Honors and awards (select)**
   - Oklahoma Medal for Excellence in Teaching at a Research University – Oklahoma Foundation for Excellence (2010); DaVinci Fellow Award – DaVinci Institute of Oklahoma (2010); George W. Tauxe Outstanding Professor Award in School of Civil Engr. & Env. Sci. – OU (2010); Outstanding Educator Award: Outstanding Contribution to Environmental Engineering and Science Education (Association of Environmental Engineering and Science Professors - 2008); Japanese Oil Chemist Society Lectureship Award (2006); David Ross Boyd Professor – University of Oklahoma (2005); Sun Oil Company Endowed Chair – University of Oklahoma (2002).

8. **Service activities**
   a. **University Level:** Director, Water Technology for Emerging Region (WaTER) Center. Associate Director, Institute for Applied Surfactant Research
   b. **College Level:** Member, College Tenure and Promotion Committee
   c. **Professional Service:** Editor-in-Chief, *J. of Contaminant Hydrology*; Associate Editor – *J. of Surfactants and Detergents*; Editorial Board: *Journal of Water, Sanitation and Hygiene for Development*. Member of DuPont Chemical Co.
Science Advisory Board for site remediation, the WaterCAMPWS Center at the University of Illinois (an NSF/STC) and the Superfund Research Center at the University of Arizona (NIEHS).

9. Publications in the last 5 years (select)
(4 books appeared, 161 refereed journal articles / book chapters appeared / in press)
Work has been cited 2,307 times with an h-index of 27 (Web of Science – Feb 18, 2011)


1. **Name:**
   LI SONG

2. **Education**
   Ph.D. Architectural Engineering  U. of Nebraska - Lincoln  2004
   M.S.  Thermal Energy  Harbin Institute of Technology  1996
   B.S.  Urban Construction  Shengyang University of Civil Engineering and Architecture  1993

3. **Academic experience** –
   2009 – present  Assistant Professor, School of Aerospace and Mechanical Engineering, University of Oklahoma, Full-time

4. **Non-academic experience**
   01/07-4/09  V.P. of Engineering Building Energy Solutions & Technology Technology Inc., Dallas (ww.bes-tech.net)
   08/04-12/06  Technology Director Building Energy Solutions & Technology Inc., Dallas (www.bes-tech.net)

5. **Certifications or professional registrations**
   P.E., Texas (96744)

6. **Current membership in professional organizations**
   Member, ASHRAE
   Member, ASME

7. **Honors and awards**
   2006 Bes-Tech Innovation of Technology Award.
   Milton E. Mohr Research Fellowship, University of Nebraska, 2003

8. **Service activities**
   a. **University Level:** UG ME committee member; Library liaison

9. **Publications in the last 5 years**


**Presentations in the last 5 years**


**10. Professional Development Activities**

NSF Career Proposal Writing Workshop, April 3-4, 2011
1. **Name:** KEITH STREVETT

2. **Education**
   - B.S. Microbiology and Public Health, Michigan State University, 1992
   - B.S. Civil and Environmental Engineering, Michigan State University, 1992
   - Ph.D. Environmental Engineering, University of Connecticut, 1995

3. **Academic experience**
   - University of Oklahoma, Professor, School of Civil Engineering and Environmental Science, 1995- Present, Full-time, 1995 - Present

4. **Non-academic experience**
   - Michigan Biotechnology Institute, Research Assistant, 1986 – 1992

5. **Certifications or professional registrations**
   - Engineering-in-Training, 1992

6. **Current membership in professional organizations**
   - Member, American Society of Civil Engineers
   - Member, Association of Environmental Engineering and Science Professors
   - Member, American Society of Ecological Engineering Society

7. **Honors and awards**
   - The Regents’ Award for Superior Teaching (2003); UOSA Outstanding Faculty Award, (2002); COE Outstanding Faculty Advising Award (2002); George W. Tauxe Award, The University of Oklahoma (2001, 2000, 1997); Larry Canter Environmental Award, The University of Oklahoma (2004, 2001); Distinguished Service Award, Association of Environmental Engineering and Science Professors (2000); Who’s Who in Science and Engineering, Marquis Biographies (1999), CAREER Award, National Science Foundation (1998); Sigma Xi — Scientific Research (1995); Chi Epsilon — Civil Engineering (1995); Gieb Fellowship, The University of Connecticut (1994); Environmental Engineering Fellowship, The University of Connecticut (1994).

8. **Service activities**
   - **University Level:** Member, Graduate College Academic Appeals Board; Reviewer, Undergraduate Research Opportunities Program’ Faculty Advisor, Eden on Campus.
   - **College Level:** none
   - **School Level:** Member, Graduate Studies Committee; Member, Undergraduate Studies Committee; Faculty Advisor, Chi Epsilon
   - **Professional Service:** Associate Editor for *Biochemical Engineering Journal*, Board Member of Oklahoma Corporation Commission-Remediation License Board.
e. **Community Service**: Scoutmaster, Troop 242; AWANA Leader, 1504; Committee Member, Central Oklahoma Science Fair.

9. **Publications in the last 5 years**


**Presentations in the last 5 years**


10. **Professional Development Activities**

8th annual Teaching Scholars Initiative, Michael Wesch Kansas State University seminar, 11/5/2010; HAZWOPER training from National Environmental Trainers, Inc, 12/16/2010
1. **Name:**
   DAVID P. SWYDEN

2. **Education**
   M.S. Structural Engineering, University of Oklahoma, 2008
   B.S. Civil Engineering, University of Oklahoma, 2007
   A.S. Pre-Engineering, Oklahoma City Community College, 2004
   A.A.S. Computer Aided Design, Oklahoma City Community College, 2004

3. **Academic experience** –
   Oklahoma City Community College, Adjunct Professor, Department of Science and Mathematics, 2011 – 2009, Part-time
   University of Oklahoma, Adjunct Professor, School of Civil Engineering and Environmental Science, 2011 – 2010, Part-time

4. **Non-academic experience**
   SAIC Energy, Environment & Infrastructure, LLC. (formerly The Benham Companies, LLC.), Engineer Intern, 2007 – 2011
   University of Oklahoma Research Assistant, Donald G. Fears Structural Engineering Laboratory, 2008 – 2005
   The Benham Companies, LLC., CAD Technician, Summer 2006
   Fitzgerald and Associates, Project Technician, Summer 2005
   Cobb Engineering, CAD Technician, Summer 2002
   Janzen Landscape, Team Member 2001 – 2002

5. **Certifications or professional registrations**
   E.I.T. Oklahoma (14022)
   CADD Specialist Certificate, Francis Tuttle Technology Center, 2003
   CAD Technician Certificate, Francis Tuttle Technology Center, 2002

6. **Current membership in professional organizations**
   Associate Member, American Society of Civil Engineers (ASCE)
   Associate Member, Oklahoma Structural Engineers Association (OSEA)
   Professional Membership, American Institute of Steel Construction (AISC)

7. **Honors and awards:**

8. **Service activities**
   a. **University Level:** n/a
   b. **College Level:** n/a
   c. **School Level:** Member, CADD Advisory Board, Francis Tuttle Technology Center
   d. **Professional Service:** n/a
   e. **Community Service:** Volunteer at Central Oklahoma Habitat for Humanity, Regional Food Bank of Oklahoma and the Oklahoma City Rescue Mission
9. Publications in the last 5 years
n/a

Presentations in the last 5 years
n/a

10. Professional Development Activities
n/a
1. **Name and Title**
   Musharraf Zaman, Professor of Civil Engineering and Environmental Science, and Professor of Petroleum and Geological Engineering

2. **Education**
   B.S., Civil Engineering, Bangladesh Univ. of Engineering and Technology, 1975
   M.S., Civil Engineering, Carleton University, Ottawa, Canada, 1979
   Ph.D., Civil Engineering, University of Arizona, Tucson, 1982

3. **Academic experience**
   University of Oklahoma, Professor of Petroleum and Geological Engineering, 2010 – Present, Full time
   University of Oklahoma, Professor of Civil Engineering and Environmental Science, David Ross Boyd Professor, 1993 – Present
   University of Oklahoma, Associate Professor of Civil Engineering and Environmental Science, 1988 – 1993
   University of Oklahoma, Assistant Professor of Civil Engineering and Environmental Science, 1982 - 1988

4. **Non-academic experience**
   Argonne National Lab, Summer Faculty Research Participant, May – Aug. 1986
   University of Arizona, Research Associate, 1981 – 1982

5. **Certifications or professional registrations**
   Registered Professional Engineer (Oklahoma #16199)

6. **Current membership in professional organizations**

7. **Honors and awards**
   David Ross Boyd Professorship (2003, life-time teaching award for outstanding contributions to teaching); Kerr McGee Presidential Professor (1997-2001); Regents' Award for Superior Research and Creative Activity, The University of Oklahoma (1992); Regents' Award for Superior Teaching, The University of Oklahoma (1990);

8. **Service activities**
   Co-Chair, 12th IACMAG Conference, held at Goa, India, Oct. 1-6, 2008; Chief Proctor, EIT Exam. (ELSES) (from 2002 to 2010); Co-Chair, 13th IACMAG Conference, held in Melbourne, Australia, May 9-11, 2011.

9. **Important Publications in the last 5 years**

10. Some Important Recent Presentations
(numerous others).
Appendix C – Equipment

In addition to the facilities covered in Criterion 7, the following equipment items are available for use in undergraduate instruction. The list includes laboratory sample preparation and testing equipment, field sampling and testing equipment, and additional computing resources.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>BUILDING</th>
<th>ROOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUN ENTERPRISE 250 SERVER</td>
<td>Carson Engineering Center</td>
<td>302</td>
</tr>
<tr>
<td>SERVER T10-108A08GA1P</td>
<td>Carson Engineering Center</td>
<td>302</td>
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<tr>
<td>SUN BLADE 2000 A 29 PSI 9C 1GM</td>
<td>Carson Engineering Center</td>
<td>302</td>
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<tr>
<td>A 29 PYI 9Y 1GMAJ SUNN BLADE 2</td>
<td>Carson Engineering Center</td>
<td>302</td>
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<td>A 29 PYI 9Y 1GMAJ SUN BLADE 20</td>
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<tr>
<td>COMPUTER WORKSTATION TO INCLUDE</td>
<td>Carson Engineering Center</td>
<td>303</td>
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<tr>
<td>BASIC EDUCATION TRIAXIAL SET F</td>
<td>Carson Engineering Center</td>
<td>S11</td>
</tr>
<tr>
<td>DYNAMIC HOLLOW CYLINDER TESTING</td>
<td>Carson Engineering Center</td>
<td>S11</td>
</tr>
<tr>
<td>DIGITAL CONTROLLER 1000 CC 2M</td>
<td>Carson Engineering Center</td>
<td>S11</td>
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<tr>
<td>TOTAL STATION TOPCON GTS211D</td>
<td>Carson Engineering Center</td>
<td>S17</td>
</tr>
<tr>
<td>1 EA TRIMBLE 5700 BASE KIT SW</td>
<td>Carson Engineering Center</td>
<td>S17</td>
</tr>
<tr>
<td>MILLING MACHINE</td>
<td>Fears Lab</td>
<td></td>
</tr>
<tr>
<td>CONCRETE PADDLE MIXER</td>
<td>Fears Lab</td>
<td></td>
</tr>
<tr>
<td>HYDRAULIC POWER SUPPLY 25 GPM</td>
<td>Fears Lab</td>
<td></td>
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<tr>
<td>CORE DRILL</td>
<td>Fears Lab</td>
<td></td>
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<tr>
<td>BRIDGE CRANE 5TON</td>
<td>Fears Lab</td>
<td></td>
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<tr>
<td>FREEZE AND THAW CHAMBER TESTER</td>
<td>Fears Lab</td>
<td></td>
</tr>
<tr>
<td>TEST EQUIPMENT ASSEMBLY</td>
<td>Fears Lab</td>
<td></td>
</tr>
<tr>
<td>TRAILER 24FT ENCLOSED</td>
<td>Fears Lab</td>
<td></td>
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<tr>
<td>TRACTOR JOHN DEERE 4400 4WD</td>
<td>Fears Lab</td>
<td></td>
</tr>
<tr>
<td>ACTUATOR MTS SYSTEMS MODEL 2</td>
<td>Fears Lab</td>
<td></td>
</tr>
<tr>
<td>HYDRAULIC ACTUATOR MODEL 244</td>
<td>Fears Lab</td>
<td></td>
</tr>
<tr>
<td>COMPRESSION TESTING MACHINE 1</td>
<td>Fears Lab</td>
<td></td>
</tr>
</tbody>
</table>
Appendix D – Institutional Summary

1. The Institution

a. Name and address of the institution

   The University of Oklahoma
   660 Parrington Oval, Room 110
   Norman, OK, 73019

   http://www.ou.edu

b. Name and title of the chief executive officer of the institution

   Mr. David L. Boren, President

c. Name and title of the person submitting the self-study report.

   Dr. Thomas L. Landers, Dean of College of Engineering

d. Name the organizations by which the institution is now accredited and the dates of the initial and most recent accreditation evaluations.

   The University of Oklahoma is accredited by the Higher Learning Commission of the North Central Association of Colleges and Schools. The initial accreditation was in 1913. Most recent evaluation was conducted in 2001-2002 and the accreditation was extended to 2012. Next comprehensive evaluation is in 2011-2012.

2. Type of Control

   The Oklahoma State System of Higher Education is the state’s legal structure for providing public education at the collegiate level. It is a coordinated system of colleges and universities located throughout the state.

   The State System is comprised of 25 colleges and universities – including two research universities, 11 regional universities and 12 community colleges – and 11 constituent agencies and one higher education center. The State System is coordinated by the Oklahoma State Regents for Higher Education, and each institution is governed by a board of regents.

   The University of Oklahoma is a state-supported research university. The official governing body of the university is the Board of Regents, composed of seven citizens appointed by the Governor with the advice and consent of the State Senate. Each Regent serves a seven-year term.
3. Educational Unit

The College of Engineering is led by Dean Thomas L. Landers. The college is comprised of six schools and two programs as shown in Figure D.1. The two programs are Engineering Physics and the Bio-engineering programs. The Architectural Engineering program is in the School of Civil Engineering and Environmental Science. Bio-engineering program offers graduate degrees with a cross disciplinary faculty. Mewbourne College of Earth and Energy houses the MPGE. The College is led by Dean Larry Grillot. While the MPGE students are officially in a separate college, they are an integral part of the College of Engineering student mentoring and enrichment activities.

Dean Tom Landers reports to the Provost Dr. Nancy Mergler, who in turn reports to the President David Boren. The organizational charts of the President and the Provost are in Figures D.2 and D.3, respectively.
Figure D.1. The University of Oklahoma College of Engineering Organizational Chart
Figure D2. The University of Oklahoma President’s Organizational Chart
Figure D3. The University of Oklahoma Provost’s Organizational Chart
4. Academic Support Units

The College of Engineering and College of Earth and Energy Programs are supported by Schools within several Colleges. The Deans of the Colleges are listed in Figure D3. The names and titles of the school directors are as follows:

College of Architecture, Charles Graham, Dean
   School of Architecture, Joel Dietrich (interim)
College of Arts and Sciences, Paul Bell, Dean
   School of Botany and Microbiology, Gordon Uno
   School of Chemistry and Biochemistry, George Richter-Addo
   School of Communication, Michael Kramer
   School of English, David Mair
   School of History, Robert Griswold
   School of History of Science, Steve Livesey
   School of Mathematics, Paul Goodey
   School of Physics and Astronomy, Greg Parker
   School of Political Science, Greg Russell
   School of Zoology, Randall Hewes

5. Non-academic Support Units

College of Engineering
   Advising, Theresa Marks
   Library, James Bierman
   IT, Paul Thompson
   Tutoring, Lisa Morales
College of Earth and Energy
   Advising, Linda Goeringer
   Library, Jody Bales Foote
   IT, Lisa Hendrix
University of Oklahoma
   Admissions, Mark McMasters
   Enrollment Services, Breck Turkington
   Academic Records, Rick Skeel
   Career Services, Bette Scott
   Center for Learning and Teaching, Michele Eodice

6. Credit Unit

Most OU courses are 3 credit hours. Since each credit hour = 50 minutes of class time per week, a course that meets on Monday/Wednesday/Friday (MWF) will meet 50 minutes each class day for a total of 150 minutes each week. A course that meets on Tuesday/Thursday (TR) will meet 75 minutes each class day for a total of 150 minutes each week. Lab courses are figured differently. For each hour of a lab credit a student receives, the student must double the minutes of class time. One semester represents 15 weeks. So, one academic year will be 30 weeks, exclusive of final examinations.
## Table D-1. Program Enrollment and Degree Data

### Civil Engineering

<table>
<thead>
<tr>
<th></th>
<th>Enrollment</th>
<th>Degrees Awarded</th>
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<td></td>
<td>Freshman</td>
<td>Sophomore</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>Bachelor's</td>
<td>Master's</td>
</tr>
<tr>
<td>Fall 2010</td>
<td>FT</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>PT</td>
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</tr>
<tr>
<td>Fall 2009</td>
<td>FT</td>
<td>34</td>
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<tr>
<td></td>
<td>PT</td>
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<td>Fall 2008</td>
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<td>30</td>
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<tr>
<td></td>
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<td>34</td>
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<tr>
<td></td>
<td>PT</td>
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</tr>
<tr>
<td>Fall 2006</td>
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<td>22</td>
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<tr>
<td></td>
<td>PT</td>
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</table>

FT--full time
PT--part time
Table D-2. Personnel

Architectural Engineering

Year: 2010

<table>
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<tr>
<th></th>
<th>HEAD COUNT</th>
<th>FTE</th>
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<tbody>
<tr>
<td>Administrative</td>
<td>.27</td>
<td>.27</td>
</tr>
<tr>
<td>Faculty (tenure-track)</td>
<td>13</td>
<td>3.43</td>
</tr>
<tr>
<td>Other Faculty (excluding student Assistants)</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Student Teaching Assistants</td>
<td>4</td>
<td>7</td>
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<tr>
<td>Student Research Assistants</td>
<td>57</td>
<td>11</td>
</tr>
<tr>
<td>Technicians/Specialists</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Office/Clerical Employees</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Others</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>
Signature Attesting to Compliance

By signing below, I attest to the following:

That University of Oklahoma’s Engineering and Computing programs have conducted an honest assessment of compliance and have provided a complete and accurate disclosure of timely information regarding compliance with ABET’s *Criteria for Accrediting Engineering Programs* to include the General Criteria and any applicable Program Criteria, and the ABET *Accreditation Policy and Procedure Manual*.

Thomas L. Landers, Dean
College of Engineering

Signature  

27 Jun, 2011
Date

Larry R. Grillot, Dean
College of Earth and Energy

Signature  

June 27, 2011
Date