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Title of Program: B. S. Joint-Degree Program in Civil Engineering, Western Kentucky University (WKU) and University of Kentucky (UK), Bowling Green, Kentucky[1]

Suggested CIP Code: Civil Engineering, B14.0801.01

Program Band Status: Engineering is within UK's approved band

Degree: B. S. Degree Program in Civil Engineering

Brief Description of Program:

The proposed joint-degree program in Civil Engineering represents an effort by the University of Kentucky (UK) and Western Kentucky University (WKU) to offer an undergraduate degree in Civil Engineering (CE) at Western Kentucky University to serve south-central Kentucky and portions of western Kentucky. The plan outlined herein is based on a vision of high-quality engineering education, delivered responsively, cost-effectively, creatively, and flexibly to meet contemporary needs in that region of Kentucky. The planned joint-degree program in Civil Engineering is one of three proposed joint-degree programs in Bowling Green; the others include a joint-degree program between UK and WKU in Mechanical Engineering and a joint-degree program between the University of Louisville and WKU in Electrical Engineering. The three programs emphasize a project-oriented educational approach, which is embraced by all participating institutions. This "integrated model," whereby students are exposed to engineering course work relatively early in their academic career, is a distinguishing feature of these new engineering programs. UK's participation in expansion of engineering education opportunities through undergraduate joint-degree program development in western Kentucky is consistent with the mission of UK as a comprehensive, public, land-grant university dedicated to preparing students for an increasingly diverse and technological world and to improving the lives of people throughout the Commonwealth. This goal is aided by the delivery of quality undergraduate engineering education to stakeholders in south-central Kentucky and portions of western Kentucky.

The "Strategy for Statewide Engineering Education in Kentucky" was crafted on behalf of the State's public university presidents and adopted by the CPE on July 17, 2000 (see Attachment 1 This document lays out the rationale for the Strategy and provides the background for its creation, which are omitted here for brevity. The reader is referred to Attachment 1 for full disclosure of detail.

To guide the planning and development of the joint bachelor's degrees, the three institutions involved (UK, WKU, and the University of Louisville) have adopted a "Framework of Agreement," offered as Attachment 2, which addresses such issues as program development

[1]By CPE definition, a "joint" program is "a program that is mutually sponsored by two or more institutions leading to a single credential or degree, which is conferred by both or all participating institutions...All participating institutions share responsibility for all aspects of the program's delivery and quality."

timing, curriculum formulation, faculty composition and status, course responsibility (e.g., agreement that UK is to be responsible for between 16 and 24 credit hours of engineering course work per year in the discipline), administrative structure, provision of academic advising, laboratory and equipment support, provision of library and media resources, and use of distance-learning technologies. Progress continues along all these fronts as program development efforts move forward. For example, in CE, in anticipation of program start-up, UK has been responsible for delivering from among the following courses (specific set of courses yet undecided because WKU to date has not filled all tenure-track faculty positions) : CE 331, CE 351, CE 382, CE 451, CE 461G, CE 482, CE 534, CE 582, and, on an alternating basis with Mechanical Engineering, EM 221. In the future, the exact courses will likely deviate from this list, however, in view of student progression within the program, specialties of WKU new-hires, and UK faculty availability for distance-delivery of courses from the UK campus or for on-site instruction in Bowling Green.

Faculty in Civil Engineering on the Lexington Campus, in concert with counterpart faculty at WKU, have formulated a curriculum for the B.S. degree program in Bowling Green. This curriculum, while similar to the curriculum in the CE program on the Lexington Campus, including the number of credits and prerequisite requirements, reflects notable differences in response to stakeholders' interests and inputs in the Bowling Green area, especially in regard to the program's emphasis on project-based learning. The Local Advisory Board for the proposed CE program has been formed for purposes of developing by-laws, drafting vision and mission statements, and for formulating program objectives. UK was represented at the initial meetings of the Advisory Board by the Department chair and/or by one or more additional senior faculty members. Another example of the collaboration between the two offering institutions is the addition of a UK/CE nominee for industry representation on the WKU/UK CE Advisory Board (Mr. James Riney), who has been invited to serve also on the Advisory Board for the Lexington CE Department. In addition, Mr. Fred Mudge serves on the executive advisory boards of both the UK College of Engineering and the WKU Department of Engineering.

The program faculty will consist of an equal number of faculty from each institution. At UK, this will include up to four faculty most involved in the instructional mission in the WKU-based program, all of whom are committed to the joint program and its distinct project-oriented approach. UK program faculty will serve on a three-year term basis, renewable as appropriate. It is the responsibility of each campus to recommend program faculty. Any exceptions or modifications to this plan must be approved by the program faculty and recommended to the Steering Committee, through the Department Head and the Dean of the Ogden College. At present, the program faculty includes: from UK, Dr. Issam Harik, Dr. George Blandford, Dr. Nick Stamatiadis, and Dr. Ed Wang; from WKU, Mr. Matthew Dettman (Program Coordinator) and Dr. Robert McKim (with two faculty positions currently unfilled).

The CE curriculum is a combination of WKU courses taught by WKU faculty members and by existing UK courses taught by UK faculty (either on-site or by distance technologies). All official student records will be maintained at WKU; however, electronic access to student

records will be provided on a need-to-know basis to all UK advisors, program faculty, and departmental and College student records personnel. In addition, WKU has agreed to provide the UK College of Engineering with a copy of the transcripts for all students enrolled in the joint program on an annual basis (or, alternately, a list of all students in the program, from which the CE staff can retrieve the records off TOPNET, the student records system at WKU), preferably just prior to the start of each fall term. From the UK perspective, UK degree certification and maintenance of copies of all graduates' transcripts will be handled by the College Dean's office, with the UK Registrar authorizing the granting of an earned UK credential from the joint-degree program. The actual diploma certificate will be produced and issued by WKU; however, both institutions will confer the degree, consistent with the CPE definition of a "joint program." For purposes of headcount, both institutions will be granted credit for students enrolled in the joint-degree program.

WKU, UK, and U of L and their joint program faculty agree to actively engage in the process of preparation for ABET accreditation, with a commitment to seek accreditation as early as possible. Because the programs are joint in nature, they will be presented to the accrediting agency jointly and accreditation will be sought independently of existing programs at UK and U of L. It is anticipated that the request for an accreditation visit will be made at the same time for all three programs jointly delivered by the three institutions on the WKU campus.

Brief Statement of the Need and Demand for the Program: This is addressed in Attachments 1 and 2; however, it is worthwhile to offer further evidence of program need and demand, as taken from documentation assembled by WKU in the early stages of program development (see Attachment 3).

The CPE has estimated that Kentucky must increase its undergraduate enrollment by 50% from approximately 160,000 to 240,000 by 2020 to bring the per capita enrollment in Kentucky into line with the projected average for the U.S. Engineering undergraduate enrollment in Kentucky, as a percentage of the entire undergraduate student body is approximately 2.25%, while nationally, undergraduate enrollment in engineering represents 3.0% of the whole. Assuming that engineering retains its current percentage of undergraduate enrollment nationally between now and 2020, Kentucky will have to increase its undergraduate engineering enrollment by almost 100%, from 3600 to 7200, to bring itself into line with national norms. Consequently, expansion of engineering programs must be a *part* of the strategy to bring engineering enrollment in Kentucky into line with national norms. The CPE has made it clear that undergraduate engineering education in Kentucky will expand primarily through the creation of joint programs managed by multiple postsecondary institutions, as is being proposed here.

Proposed Program Options: Proposed is a B.S. degree program in Civil Engineering. While selection of technical electives permits the student to concentrate in one or more technical sub-disciplines, no program options are envisioned.

Job Opportunities for Program Graduates: This topic was addressed in Attachment 3. In spite of the recent economic downturn since mid-1999, the job market for civil engineering graduates remains firm. Kentucky still ranks near the bottom in engineering graduates per capita, a statistic which stands to be improved with distributed engineering education opportunities. Recent graduates from these two program areas have been less impacted by the mild recession than have graduates from such programs as electrical engineering, chemical engineering, and computer science. Working to the advantage of the placement of graduates is the following Strategy statements: (1) "the strategy will encourage recruiting, mentoring, and placement initiatives for women and minorities; (2) the strategy envisions the creation of a clearinghouse for information about student engineering employment opportunities, including cooperative education, summer internships, and permanent employment with Kentucky businesses and industries; and (3) students at participating institutions will be encouraged to apply for graduate study in engineering..."

Plans for Program Delivery Through Distance Learning Technologies:

Kentucky has invested significantly in distance learning infrastructure within the last decade. Initial University plans were to use the system to deliver graduate-level instruction to parts of the state that were distant from the major research institutions. Early College experience via distance was in the delivery of graduate programs in Mining Engineering and toward the Master of Engineering program, both of which are now suspended in distance mode. The Civil Engineering Department has offered several dual-level courses via ITV, primarily in support of the Master of Engineering program; however, until the recent experiences (Spring 2003) by offering CE 331 and in (Fall 2003) by offering CE 351, both via ITV, the Department has had limited involvement in distance-based undergraduate education.

In the proposed undergraduate program steady-state, UK faculty will deliver 16-24 credits per year per program, for a total of 32-48 credits. With consideration that one course, EM 221, is required by both majors, this number falls to 29-45. It is likely that the courses offered by UK faculty will be a blend of on-site and distance-based (primarily ITV or ITV/Web-assisted) courses,[2] complemented by dedicated MS Messenger connections between sites, permitting sharing of application software (e.g., PowerPoint) and video. The College and University have already equipped a sufficient number of ITV rooms, both at UK and at WKU, with required computers, data projectors, and cabling for this purpose. For courses with a significant distance component, on-site, content-proficient faculty (usually WKU faculty, with or without UK joint

[2]In the Paducah programs, for example, there are typically two to four courses per year transmitted via compressed video, originating either in Paducah or in Lexington, and delivered to the alternate site. This course-sharing has aided immeasurably during new-program start-up as on-site faculty members were hired, has assisted communications among faculty colleagues separated by distance, and has permitted strategic faculty hiring decisions to be made by considering faculty in areas of sub-specialization that complement faculty strengths on the alternate campus.

appointment) or UK graduate students or post-doctoral fellows will serve as "faculty associates," when needed, again building upon College experience over the past six years. (Note: In Spring 2003, a member of the WKU program faculty served as a faculty associate at the receive site, but in the future, other arrangements must be made, as WKU faculty resources cannot be made available as programs reach steady-state.) It is envisioned that most courses will be delivered primarily via ITV (with periodic visits to WKU) in early stages of program development. A recent study of six years' worth of data (1997-2003) of teaching effectiveness by distance means, conducted by the Mechanical Engineering Department in October 2003 and involving 581 student enrollments (382 at the originating site and 199 at the receive site), has suggested that ITV delivery of ME course work is *at least* as effective in terms of overall value of the course and quality of teaching (data available upon request).

At present, there are eleven ITV-equipped classrooms in the Bowling Green vicinity, five on the WKU campus, two at the WKU Extended Campus in Glasgow, and one each at the Kentucky Advanced Technical Institute (Bowling Green), the County Support Services Center (Bowling Green), Glasgow High School (Glasgow), and Franklin-Simpson High School (Franklin). All are part of the Kentucky Tele-Linking Network, of which UK is a member institution. The technologies and procedures in place at each distance-learning site will be evaluated as the program progresses. These will be updated as appropriate to provide continuous improvement to the distance-learning program as newer technology develops.

Names of Primary Contacts at Proposing Institution: (1) Dr. G. T. Lineberry, Associate Dean for Commonwealth and International Programs, College of Engineering, University of Kentucky, 234 Mining & Minerals Resources Bldg., Lexington, KY 40506-0107; Office: 859/257-2833; Fax: 859/323-1962; Email: gtli@engr.uky.edu. (2) Dr. Issam Harik, Department Chair, Department of Civil Engineering, University of Kentucky, 161A Oliver H. Raymond Bldg., Lexington, KY 40506-0281; Office: 859/257-3116; Fax: 859/257-4856; Email: iharik@engr.uky.edu.

Names of Contacts at Partnering Institution: (1) Dr. John Reis, Head, Department of Engineering, Western Kentucky University, One Big Red Way, Bowling Green, KY 42101-3576 Office: 270/745-2461; Fax: 270/745-5856; Email: john.reis@wku.edu. (2) Mr. Matthew Dettman, Program Coordinator, Department of Civil Engineering, Western Kentucky University, One Big Red Way, 206A Science & Technology Hall, Bowling Green, KY 42101-3576; Office: 270/745-2462; Email: matthew.dettman@wku.edu.

Preliminary Plans for Collaboration with Other Institutions: The "Strategy for Statewide Engineering Education in Kentucky" (Attachment 1) establishes the guiding principles for future expansion of engineering education in the Commonwealth, with the "Framework of Agreement" (Attachment 2) outlining the collaborative nature of the programs' design. As further examples of collaboration to date, several additional sets of materials are offered: (1) curriculum for the BSCE program, as recommended for approval by the WKU/UK CE program faculty (Attachmen 4); (2) admission requirements into the proposed joint degree program, as agreed upon by the

WKU/UK CE program faculty on November 11, 2002 (Attachment 5); and (3) an important addendum to the Framework of Agreement, forged in early-2004 between UK and WKU, which handles issues previously insufficiently addressed in the original Framework (Attachment 6).

Tentative Program Implementation Date: Upon approval of said programs by the CPE and upon assurance of recurring State funding. Refer to Attachment 7 for the draft budget.

Attachment 1. Strategy for Statewide Engineering Education in Kentucky

ACTION
Agenda Item D-1
July 17, 2000

STRATEGY FOR STATEWIDE ENGINEERING EDUCATION IN KENTUCKY

Recommendation:

That the Council approve the attached Strategy for Statewide Engineering Education in Kentucky

That the Council instruct staff to expedite reviews of all proposed programs that fall within this strategy.

That the Council commend the presidents, chief academic officers, and members of institutional faculties and staffs for working together to develop this strategy quickly.

Rationale:

This statewide strategy takes advantage of the substantial resources invested in engineering, science, and technology while creating programs that are multi-institutional, and available throughout the state, and that meet the needs of traditional and nontraditional students as well as practitioners.

This strategy reflects the intent of *The Postsecondary Education Improvement Act of 1997* and the Council s *Action Agenda*: to grow responsibly, to focus on the highest possible quality, to use resources effectively, to use technology wisely, to target underserved areas, and to help employers be successful.

The need for expanded engineering education is immediate and requires that programs of high quality be developed, approved, and implemented as quickly as possible.

Background:

At its March 2000 meeting, the Council requested that the University of Kentucky, the University of Louisville, Western Kentucky University, and Council staff, in consultation with the other comprehensive universities and the Kentucky Community and Technical College System, design a proposal to expand engineering education in Kentucky.

Since the March meeting, the presidents of Kentucky s universities, the president of the KCTCS, and the chief executive officer of the Kentucky Commonwealth Virtual University have met several times with Gordon Davies and Sue Hodges Moore and held a joint meeting with chief academic officers and faculty representatives. The chief academic officers and faculty representatives also met to discuss the strategy.

The strategy has been signed by the presidents, with the exception of Dr. Charles Wethington, University of Kentucky, who is consulting with the UK engineering faculty.

Strategy for Statewide Engineering Education in Kentucky
July 17, 2000

Kentucky needs a statewide strategy to educate more engineers and to integrate engineering education more closely into the technology-driven New Economy. The Council on Postsecondary Education, at its March 20, 2000, meeting, approved the recommendation that the public universities and colleges work together with the Council staff to design a statewide strategy to expand engineering education. The statewide strategy is intended to meet two primary needs:

1. the need to increase the number of baccalaureate engineers in Kentucky, and
2. the need to address regional issues of access and productivity in engineering education.

Kentucky s progress in meeting these needs will be assessed periodically by the Council and all participating institutions.

The strategy for engineering education in Kentucky will eventually integrate secondary, baccalaureate, and post-baccalaureate programs. It will involve secondary schools, the Kentucky Community and Technical College System, the comprehensive universities, the research universities, the independent colleges and universities, and the Kentucky Commonwealth Virtual University.

Access to undergraduate engineering education will expand primarily through the creation of joint programs managed by multiple postsecondary institutions. The programs will be tailored to meet demonstrated regional or statewide needs. They will be separately accredited and degrees will be conferred jointly. All participating institutions will be involved in program development, delivery, and administration. Students will be able to complete all degree requirements at their home campus through resident instruction, courses delivered through the Kentucky ~~Commonwealth~~ Virtual University, or courses delivered by participating institutions through other distance delivery methods.

The Council would like to consider the first joint program proposals as early as November 2000. The Council will accelerate the approval process for joint programs that satisfy the criteria outlined in this strategy document s final form.

The joint programs should build on the strengths of existing engineering programs at the University of Kentucky and the University of Louisville while accommodating employer needs identified by the comprehensive institutions. The University of Kentucky and the University of Louisville will agree which institution will have the responsibility for statewide development of joint programs by discipline with interested comprehensive institutions. All joint programs will become separately accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC/ABET) as soon as possible.

During the start-up phase of each joint program, the deans of engineering at the University of Kentucky and the University of Louisville will, on behalf of all participating institutions, recommend that the Kentucky State Board for Licensure for Professional Engineers and Land Surveyors grant approval to the joint program so that students may sit for the appropriate Engineering Fundamentals Examination administered by the board twice yearly in Lexington and Louisville.

The specific structure of each joint program may differ from one another, depending on the needs of area employers and the strengths of the institutions involved in each program. Prior to submitting a proposal for the Council s consideration, the appropriate faculty of each participating institution will agree on the appointment, tenure, and promotion policies for program faculty, the allocation of equipment and facilities, provision of student services, assessment criteria, and the general management of the joint program. Decisions regarding the salary, rank, and tenure of individual faculty members will be the responsibility of the employing institution. Adjunct or joint appointments to the faculty of the other participating institution(s) may be offered.

The Council staff will recommend to the Council appropriate funding for the equipment and facilities needs of the strategy as the Council develops its operating and capital budget recommendations for the next biennium. Funding could also be sought in the 2002 Legislative Session as part of the New Economy initiatives authorized in House Bill 572 of the 2000 session.

Working with the institutions, the Council will develop procedures for counting enrollments and graduates, disbursing funds, and establishing tuition rates.

The strategy is open to selected, non-duplicative, stand-alone engineering programs at comprehensive universities as well as to other types of multi-institutional arrangements. The strategy also envisions the continued strengthening and expansion of the existing engineering programs at the University of Kentucky and the University of Louisville and the development of new undergraduate and graduate engineering programs that support the strategic plans of both institutions and the New Economy initiatives.

The Kentucky Community and Technical College System and Lexington Community College will develop pre-engineering curricula (in conjunction with the University of Kentucky and the University of Louisville) that will enable community and technical college graduates to meet all third-year engineering entrance requirements of Kentucky s public baccalaureate institutions. In addition, the Kentucky Community and Technical College System and Lexington Community College may develop additional Engineering Technology programs at the associate degree level. The universities may also work with the Kentucky Community and Technical College System and Lexington Community College to offer such programs and to align associate and baccalaureate engineering technology programs. These programs will become accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (TAC/ABET) as soon as possible.

The strategy will encourage recruiting, mentoring, and placement initiatives for women and minorities.

The strategy envisions the creation of a clearinghouse for information about student engineering employment opportunities, including cooperative education, summer internships, and permanent employment with Kentucky businesses and industries.

Students at participating institutions will be encouraged to apply for graduate study in engineering at the University of Kentucky and the University of Louisville. Engineering articulation agreements, early admissions policies, and other strategies will be used to make the transition to graduate study as smooth as possible. The strategy is also open to the use of comprehensive institutions as remote sites for the delivery of master s programs of the University of Kentucky and the University of Louisville through resident instruction, courses delivered through the Kentucky Commonwealth Virtual University, or courses delivered through other distance delivery methods.

The Council will play its usual coordinating role in the development and implementation of the strategy, including adjudicating disputes, facilitating statewide discussions, measuring effectiveness, and determining statewide funding and construction needs.

Signed July 5, 2000

Kern Alexander, MuSU

Ronald G. Eaglin, MoSU

Robert Kustra, EKU

Michael B. McCall, KCTCS

Gary A. Ransdell, WKU

George W. Reid, KSU

Mary Beth Susman, KCVU

John W. Shumaker, UofL

James C. Votruba, NKU

Charles T. Wethington, UK

Gordon K. Davies, CPE

Attachment 2. Framework of Agreement.

Office of the Provost and Vice President
for Academic Affairs
270-745-2296
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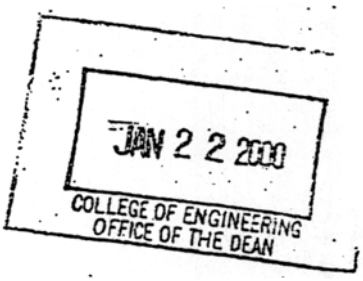
WESTERN KENTUCKY UNIVERSITY

Western Kentucky University
1 Big Red Way
Bowling Green, KY 42101-3575

January 17, 2001



MEMORANDUM

TO: Dr. Charles Wethington, President
Dr. John Shumaker, President
Dr. Elisabeth Zinser, Chancellor
Dr. Carol Garrison, Provost
Dr. Thomas Lester, Dean
Dr. Thomas Hanley, Dean

FROM: Barbara G. Burch
Provost and Vice President for Academic Affairs

RE: Framework of Agreement

Attached for your files is a copy of the signed Framework of Agreement for the WKU-UK/UofL Joint Bachelor's Degrees in Civil, Electrical and Mechanical Engineering.

BGB:lph

Attachment

xc: President Gary Ransdell
Dr. Martin Houston
Dr. Daniel Rabuzzi

FRAMEWORK OF AGREEMENT

WKU-UK/UofL JOINT BACHELOR'S DEGREES IN CIVIL, ELECTRICAL, AND MECHANICAL ENGINEERING

Western Kentucky University, the University of Kentucky and the University of Louisville, wish to enter agreements to jointly offer Bachelor of Science degree programs in civil engineering, electrical engineering, and mechanical engineering. The joint degree programs will be developed based on the following understanding:

1. The joint degree programs will be developed and offered consistent with the "Strategy for Statewide Engineering Education in Kentucky" recommended by the presidents of the public post-secondary institutions in the state and adopted by the Kentucky Council on Postsecondary Education in July 2000.

2. The joint degree programs will follow the principles contained in the policy on Joint Programs approved by the Kentucky Council on Postsecondary Education.

3. The joint degree programs will be offered on the campus of Western Kentucky University, primarily to serve students in south central and portions of western Kentucky.

4. The three universities agree to pursue the development of the joint degree program as expeditiously as possible so that the curricula can be implemented by fall, 2001.

5. The University of Kentucky will work with Western Kentucky University to jointly offer bachelor's degree programs in civil engineering and in mechanical engineering. The University of Louisville will work with Western Kentucky University to jointly offer a bachelor's degree in electrical engineering.

6. The three universities agree to present the basic outlines and principles of the joint degree programs to the February 2001 meeting of the Kentucky Council on Postsecondary Education.

7. The three universities will agree on the curricula. The curricula will be consistent with EAC/ABET criteria. General education requirements will be coordinated through the statewide General Education Transfer Framework agreement and through negotiation of any outstanding additional issues.

8 The three universities will be jointly responsible for course offerings and will fulfill instructional responsibilities consistent with SACS accreditation standards. The University of Kentucky and the University of Louisville will be expected to be responsible for 16-24 hours of engineering course work per year in the discipline. This course work may be offered through both electronic and on-campus formats and may in part be offered by faculty who hold joint faculty appointments between Western Kentucky University and the University of Kentucky or between Western Kentucky University and the University of Louisville, as appropriate. Western Kentucky University will be expected to provide the balance of the course work leading to the degrees. The three universities will agree on appropriate delivery formats.

9. Western Kentucky University agrees to dedicate at least four full-time faculty positions to support instruction in each joint degree program. The University of Kentucky, University of Louisville, and Western Kentucky University will seek supplemental funds through the Council on Postsecondary Education to meet their instructional responsibilities to the joint degree programs. The credentials of all faculty assigned by any of the participating universities to the programs will be consistent with applicable SACS and EAC/ABET criteria.

10 Faculty in the program will be employed and hold their primary faculty status with the "home" institution. The University of Kentucky and Western Kentucky University shall be collaboratively involved in the process of staffing the programs in civil and mechanical engineering. The University of Louisville and Western Kentucky University shall be collaboratively involved in the process of staffing the program in electrical engineering. All newly hired tenured/tenure-track program faculties will normally possess an appropriate doctorate in the discipline or closely related discipline. All program faculty will be subject to the tenure and promotion guidelines of their "home" institution. All program faculties will be eligible for licensure as professional engineers in Kentucky. The University of Kentucky and the University of Louisville may grant appropriate faculty status to Western Kentucky University faculty members assigned to the joint programs. Western Kentucky University may grant appropriate faculty status to faculty members assigned to the joint degree programs by the University of Kentucky and the University of Louisville.

11 The joint programs will be hosted by the Department of Engineering in the Ogden College of Science, Technology, and Health at Western Kentucky University. Administration of the Department will be the responsibility of the Head, Department of Engineering. The Dean of the Ogden College, following existing policies and procedures of Western Kentucky University, will select the department head. It is expected that the Dean of Ogden College will consult with the deans of engineering at the University of Kentucky and the University of Louisville in the appointment and reappointment of the Head of the Department.

of Engineering. The Head of the Department will report to the Dean of Ogden College in consultation with deans of engineering at the University of Kentucky and the University of Louisville.

12. Program coordinators for each of the joint engineering programs will be appointed from the resident program faculty by the dean of Ogden College at Western Kentucky University in consultation with the deans of engineering at the University of Kentucky or the University of Louisville, as appropriate. A liaison for each of the joint programs will be appointed by the respective deans of engineering at the University of Kentucky or the University of Louisville in consultation with the Dean of Ogden College.

13. A Joint Engineering Program Steering Committee will be created to oversee the implementation of program policies and formulation of changes and/or new policies. The committee takes policy changes through the respective universities' established processes. Membership consists of the Provost of the University of Louisville, the Chancellor of the Lexington Campus of the University of Kentucky, and the Provost and Vice President for Academic Affairs of Western Kentucky University, the Dean of the Speed Scientific School, the Dean of Engineering at the University of Kentucky, and the Dean of the Ogden College of Science, Technology, and Health at Western Kentucky University, or their designated representatives.

14. Insofar as possible, the participating universities agree that course work leading to each of the degrees will be articulated with the partnering institution. However, it is recognized that the joint degree programs offered at WKU will embrace an applied, project-oriented educational approach. Since the curricula of the joint programs will incorporate some innovative elements, the universities agree that the curriculum for each program will be comparable, but not identical with the companion programs at the University of Kentucky and the University of Louisville.

The universities agree that an Admissions Committee, whose members will ensure that students entering the programs meet common admissions standards and that criteria for recommending admission are applied uniformly, will govern admission into the joint programs. Membership will consist of the Associate Deans of Engineering for undergraduate studies (or equivalent) at the University of Kentucky and at the University of Louisville, and two members of the program faculty at Western Kentucky University selected by the Department Head of Engineering.

Students currently enrolled at Western Kentucky University may be admitted into the joint engineering programs beginning in fall 2001. Such students will be required to satisfy the applicable admission standards.

17. Western Kentucky University will provide basic administrative support for the joint degree programs, including admission services, registration, and student financial aid.

18. Academic advising will be provided by the full-time resident faculty at Western Kentucky University and by any full-time faculty members assigned to the program by the University of Kentucky and the University of Louisville.

19. Laboratory and equipment support for the joint degree programs will be provided by Western Kentucky University, supplemented by appropriate additional resources provided by the state. Western Kentucky University, the University of Louisville, and the University of Kentucky agree to prepare a joint proposal through the Council on Postsecondary Education for special state funding for laboratory and equipment support.

20. Western Kentucky University agrees to provide appropriate library and media resources to support the joint degree programs supplemented by resources that can be made available by the University of Kentucky, the University of Louisville, and the Kentucky Virtual Library.

21. The three universities agree to study ways in which distance learning technologies and the Kentucky Virtual University can be used to effectively and efficiently deliver instructional content for the joint degree programs.

Elizabeth A. Zinser
Chancellor, Lexington Campus

University of Kentucky

Carol Z. Garrison
University Provost
University of Louisville

Thomas. W. Lester, Dean
College of Engineering

University of Kentucky

1/12/01
Date

Barbara G. Burch
Provost and Vice President for
Academic Affairs
Western Kentucky University

Thomas R. Hanley, Dean
Speed Scientific School
University of Louisville

Martin R. Houston, Dean
Ogden College of Science,
Technology, and Health
Western Kentucky University

Attachment 3. WKU statement of program need.

1.02 Internal/External Influences

Engineering education in Kentucky has been delivered under a system that allowed only the University of Kentucky, among the publicly- supported institutions, to offer engineering programs at the baccalaureate and advanced levels. This stricture was modified when the University of Louisville became part of the publicly-supported higher education system, but, for the regional institutions of the state, the prohibition has remained intact. As a consequence, accredited baccalaureate engineering programs have been available only in Lexington and the number and origin of engineering students have been affected. To the extent that availability of engineering programs affects regional economic development, the decision to limit accessibility in Kentucky has most certainly affected the manner in which the state has developed.

Substantial evidence exists which describes the productivity of the current engineering education system in Kentucky. A study, "Engineering Education Needs and Instructional Delivery Models for Far Western Kentucky" presented by MGT of America Inc to the Council on Higher Education in 1995, contains a variety of data descriptive of the engineering education system.

- The total number of engineering schools and the number of schools per million population in the ages 15-44 in Kentucky is substantially less than in the contiguous states, the SREB states, and the national average for all states.
- The undergraduate engineering enrollment and the enrollment per million population in the ages 15-44 in Kentucky is substantially less than in the contiguous states, the SREB states, and the national average for all states.
- The baccalaureate engineering degrees granted and the baccalaureate degrees granted per million population in the ages 15-44 are substantially less than in the contiguous states, the SREB states, and the national average for all states.
- The average enrollment per institution in Kentucky is higher than in the contiguous states, the SREB states, and the national average but the number of degrees/ institution is smaller.
- The percentage of engineering enrollment to total enrollment for first-time enrollment students in Kentucky is substantially lower than the national average.
- The interest and potential of high school seniors in Kentucky in engineering education are essentially the same as in the contiguous states, the SREB states, and the national average.
- There are regions of the state significantly under-represented in engineering education.

In addition, the proportion of workers in Kentucky who are engineers is significantly lower than the national average.

More recent data show little change from the earlier results. The 1998 *Directory of Undergraduate Engineering Statistics* contains data which suggest that Kentucky continues to enroll students on a per capita basis at about one-half of the contiguous states average and less than any of its contiguous states. Kentucky

also continues to produce baccalaureate engineering degrees, on a per capita basis, at about one-half of the contiguous states' average and, again, less than any of its contiguous states. Similar results are seen for the individual engineering disciplines.

Competition among states for economic development will continue to be intense for the coming decades. One factor for success in that competition will be the level of technical preparation of the work-force, including engineers, within each state. By almost any measure of productivity in engineering education at the baccalaureate level, Kentucky does not compare favorably with the states with which it must compete. The total number of engineering students, proportion of engineering students to all students, per capita engineering students, number of engineering graduates, and per capita engineering graduates are all below the levels observed nationally and regionally. Examination of the distribution of engineering students by county of origin or region of origin within the state demonstrates the effect of limiting the availability of engineering education.

Kentucky, if it wishes to better position itself for economic development in the coming decades, needs to establish a system with greater distribution of baccalaureate engineering programs. The need is for *basic*, *baccalaureate*, *practice-oriented* programs of good quality capable of producing graduates within a region who will help attract industrial and other economic development to that region. Kentucky does not need to duplicate the programs at the University of Kentucky or the University of Louisville. The advanced programs at those institutions serve the state well and should be enhanced but should also be complemented by basic programs distributed throughout the state. Such a system would address the deficiencies of the current arrangement and can be implemented within the context of existing resources.

Since the need is for baccalaureate programs, the regional institutions must, of necessity, become the focus for a modified system. The regional institutions have the prerequisite supporting programs and facilities to offer a wide range of baccalaureate curricula including, where appropriate, engineering programs . Kentucky has made a substantial investment in its regional institutions and should capitalize on that investment to meet its long-term needs.

WKU has significant experience with engineering- related programs. As a consequence of having offered accredited, baccalaureate engineering technology programs since 1973, the University has made a significant investment in facilities, equipment, library resources, and faculty of the kind and quality necessary to support basic engineering programs. In addition, WKU has gained credibility with area industries for the quality of technical preparation of the graduates of the engineering technology programs. Many of the nearly 1,000 graduates of those programs have made substantial contributions to industries throughout the state.

To demonstrate the specific regional need, WKU, in cooperation with UK has performed an engineering education needs assessment in Western's primary region of impact.

Needs Assessment

The 1997 Kentucky Directory of Manufacturers was used to identify 203 companies with more than five employees and more than $500,000 in annual sales in the 27 county region surrounding Western Kentucky University. Added to this group were 13 additional non-manufacturing companies that had hired WKU engineering technology graduates during the past five years. The resulting 216 companies comprised the list to be contacted by telephone to determine current and future hiring practices for engineers and other pertinent information. The set of companies selected was not intended to be exhaustive of those with a possible interest in engineering education issues but sufficiently broad to provide a reliable source of information about the issues of interest.

The survey produced responses from 165 or 77.4% of the firms in the survey population. Of that group, 82 companies reported employing a total of 907 engineers or engineering technologists. Mechanical and electrical engineers/engineering technologists were the most frequently reported with 36% of the total number from those two disciplines. Additionally, it is likely that a significant portion of the industrial, manufacturing, and electro-mechanical engineers reported are trained in the mechanical and electrical engineering/engineering technology disciplines.

The survey produced evidence of a strong current and future need for engineers in the survey region. Almost 80% of the companies who employ engineers or engineering technologists indicated that they anticipated new hires within the next two years and almost 60% anticipated hiring replacements during the same period. The total demand was reported to be 227 anticipated hires during the period. For longer periods, a smaller percentage were willing to project hiring activity, but a significant demand was reported over a period of at least a decade. (It is important to note that valid responses would include zero, so the missing respondents chose not to respond which may or may not indicate no interest in hiring new or replacement engineers.)

The needs assessment indicated a strong regional interest in engineering education and a strong demand for engineering graduates. Respondents to the survey mentioned the lack of an engineering degree programs at Western Kentucky University as a significant issue. Respondents to a Chamber of Commerce business climate survey in Bowling Green cited difficulty attracting sufficient numbers of engineers more than any other issue. As one respondent succinctly stated - "need engineers badly."

Data which describe the productivity of the current system of engineering education provide a compelling case for change. The current system exhibits low productivity for enrollment and for production of graduates compared to other

states and regions. Indeed, Kentucky currently is among the least productive states in the nation for per capita production of baccalaureate engineering degrees. Moreover, the current system results in an uneven distribution of engineering students geographically across Kentucky. To the extent that engineering education is a factor in economic development of the state and its regions, these and other data suggest that fundamental change is needed. Additionally, the strength of interest and need identified in the needs assessment suggest that the South-central Kentucky region is one in which a response is imperative.

1.03 Relationship to University Organization Structure

The existing programs in engineering technology at WKU are contained in the Department of Engineering Technology:

Department of Engineering Technology

Civil Engineering Technology (CET)*	Electrical Engineering Technology (EET)*	Electro-Mechanical Engineering Technology (EMET)*	Mechanical Engineering Technology (MET)*	Environmental Science/ Industrial Hygiene**

*accredited by TAC of ABET
** accredited by RAC of ABET

Under the proposed modification, the engineering technology programs will be replaced and the department will be renamed the Department of Engineering. The Department of Engineering will contain the programs:

Department of Engineering

Civil Engineering	Electrical Engineering	Mechanical Engineering	Environmental Science/Industrial Hygiene

The Department of Engineering will be administratively contained within the Ogden College of Science, Technology, and Health with its department head directly responsible to the dean. Ogden College is one of five undergraduate colleges reporting to the Provost and Vice-President for Academic Affairs. The organizational chart which follows depicts the relationship of the Department of Engineering to the other units.

Attachment 4 WKU-UK Civil Engineering Curriculum, Bachelor of Science

Note *For comments regarding the curriculum and course syllabi, refer to page 3 of 3 of the Ma 30, 2003 Memorandum from Harik to Dettman. The memorandum follows this page and course syllabi follow the memorandum.*

WKU-UK Joint Bachelor of Science Program in Civil Engineering Curriculum

First Semester		Second Semester	
UC 101 Freshman Seminar	2	CE 160/161 Surveying I & Lab	4
AMS202 CADD for Architecture	3	MATH227 Calculus II	4.5
MATH126 Calculus I	4.5	PHYS250/251 Physics I & Lab	
GEOL111/113 Physical Geology & Lab	4	ENG 100 Freshman English	
HIST119(120) Western Civilization	3	SCOM161(145) Public Speaking	3
	16.5		18.5
Third Semester		**Fourth Semester**	
*CE303 (UK)** Construction Mgmt*	3	*EM302 (UK)** Mech of Deform Solids*	3
CE304 Construction Mgmt Lab	1	ME331 Strength of Mat Lab	1
*EM221 (UK)** Statics*	3	MATH331 Differential Equations	3
MATH327 Multivariable Calculus	4	PHYS260/261 Physics II & Lab	4
CHEM120/121 Chemistry I & Lab	5	Category A-II Foreign Language	3
CS245 Computer Prog Lang	1.5	ENG200 Intro to Literature	3
	17.5		17
Fifth Semester		**Sixth Semester**	
CE410/411 Soil Mechanics & Lab	4	CE316 Equipment & Methods	3
ME362 Thermo/Fluids	4	*CE331 (UK)** Transportation Eng*	3
STAT301 Prob & Applied Stats	3	*CE382 (UK)** Structural Analysis*	
ENG300 Junior English	3	CE370 Materials of Construction	3
Category C Soc & Behav Sci Elective	3	Technical Elective	3
	17		15
Seventh Semester		**Eighth Semester**	
Category B-II Humanities Elective	3	CE498 Senior Project	3
*CE351 (UK)** Intro Environmental Eng*	3	Technical Elective	3
*CE482 (UK)** Elem Structural Design*	3	Category B-H Humanities Elective	3
*CE461 (UK)** Hydrology*	3	Category E Cultures Elective	3
Technical Elective	3	ECON202E Economics	3
Category F Health & Wellness Elec	1	SFTY171 Category F	1
	16		

Total Hours = 133.5

** Identical to courses offered by at UK

Revised 11/06/02

UK vers y of Kentuc
COLLEGE OF ENGINEERING

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MEMORANDUM

TO: Matt Dettman

FROM: Issam Harik

RE: Joint WKU/UK CE Degree Program

DATE: May 30, 2003

The UK Civil Engineering Education Team met on Tuesday, May 6 to discuss the proposal submitted by Associate Dean G.T. Lineberry on the Joint WKU/UK Civil Engineering Degree Program. This is one of the steps in the process to obtain approval of the proposed joint degree program.

A number of questions were raised at this meeting. Some of the questions focused on the Engineering Standing Criteria to be implemented in the joint degree program. The following description has been proposed by the Education Team prior to submission to the UK CE faculty in Fall 03. I would like to solicit the input from the WKU CE faculty on this issue as well as address the subsequent questions prior to submission to the CE Faculty. Your response by the first week in August 2003 is appreciated so that the UK CE faculty can vote and forward its recommendation to the College of Engineering.

Engineering Standing in the Joint WKU/UK CE Program

Formal admission to "engineering standing" in civil engineering can occur by application after students complete the core civil engineering courses listed in the table below. In order to earn Engineering Standing, students are required to earn a C or better in each of the core civil engineering courses with a cumulative GPA of 2.5* or better in the listed core classes.

Deleted: would

Deleted: should

Core Courses for Civil Engineering Standing

Course	Credits	Course	Credits
AMS 202	3.0	ENG 100	3.0
CE 160/161	4.0		
UC101	2.0	CHEM 120/121E	5.0
MATH 126	4.5	GEOL 111/113	4.0
MATH 227	4.5		
MATH 327	4.0	PHY 250/251	4.0

Repeat Options and Request for Waivers

"Use of official repeat options can be used to improve grades in the core courses, with a limit of repeats as allowed by WKU.

Students who do not meet the listed entrance requirements for Engineering Standing but have achieved a core GPA of 2.25* or higher may request a review of the application by the Department of Civil Engineering Exceptions Committee. Reviews will be conducted in January and August. If a majority of the committee decides against the applicant request, but remedial action could improve the applicant's chances of success, then the committee chair will so state and the Department will forward the recommendation(s) to the applicant.

A student may apply twice for Engineering Standing. If a student is denied Engineering Standing after two applications, the student will be terminated from the Civil Engineering Program.

NOTE: Any student eligible to file for a degree program prior to May 2004 may petition for waivers of specific core requirements. Recommendations related to the petition must be approved by a majority vote of the joint program faculty.

Similarly, a student may petition for a waiver of course prerequisites if enrolled prior to May 2004. Recommendations related to the petition must be approved by a majority vote of the joint program faculty. Subsequently, students will be required to adhere to course prerequisites.

Deleted: Student requests for a waiver will be considered upon petition to the joint program faculty provided a minimum core GPA of 2.25 has been earned. Recommendations on the petition will require a majority vote of the joint program faculty.¶

Curriculum sheet question:

a. Is there any plan to offer separate steel and concrete courses.
b. Can students take Dynamics and other non-CE tech electives?

Course questions:

CE 326 Engineering Law: In item 9, it is stated that the course will contribute to Objective 1 – Engineering Design. Please elaborate briefly on the contribution.

CE 360 Estimating, Scheduling and Bidding: In item 8, it is stated that the course will contribute to 4(b) – Engineering Science. Please elaborate briefly on the contribution.

CE 366 Mechanical and Electrical Systems: The course has CE 303 as a prerequisite Should Physics (and possibly Thermo?) be added as a prerequisite?

CE 370 Materials of Construction: This is a 3-credit hour course and under item 7 it is listed that "Two 2-hour lecture sessions per week" for a total of four hours of lecture. In item 5.9, it is statesd that "Perform all necessary field tests to achieve ACI Level I Certification". Should the course be divided into a 2-cr hr of lecture and 1 cr hr of lab? Or other combination of lecture + lab.

CE 416 Construction Administration: In item 8, it is stated that the course will contribute to 4(b) – Engineering Science. : In item 9, it is stated that the course will contribute to Objective 1 – Engineering Design. Please elaborate briefly on the contribution.

CE 476 Highway Construction: CE 370 is a prerequisite. However, the topics covered in CE 470 do not rely on the material covered in CE 370. Please elaborate.
The textbook for CE 476 is dated 1990. Is there a more recent edition?

CE 480 Surveying III: Please list the topics the topics for this course?

CE 498 Senior Project: In item 8, it is stated that the course will contribute to 4(b) – Engineering Science. Please elaborate briefly on the contribution.
If CE 498 is the Capstone Design Course, please provide a brief description of the types of projects for this course.

Technical Electives: Please provide a listing of Technical Electives in addition to the Surveying and Construction electives.

1. *Department, number and title of course:* CE 160 Surveying I

2. *Course (catalog) description:* A study of the basic principles of surveying. Topics include field notetaking, taping distances, differential leveling, profile leveling, angular measurements, bearings & azimuths, EDM, traversing, topographic mapping, and construction stakeout. The use of care of surveying equipment includes: automatic levels, theodolites, pocket transits, total stations, and data collectors.

3. *Prerequisites:* High School Algebra & Trigonometry, and AMS 202

4. *Textbook(s) and/or other required material:* Elementary Surveying, An Introduction to Geomatics, 10th edition, Paul R. Wolf & Charles D. Ghilani, Prentice Hall, 2002

5. *Course Objectives:*
   Upon completion of this course, the student should be able to:
   1. Perform leveling calculations and adjustments
   2. Recognize techniques and importance of taking good field notes
   3. Determine bearings and azimuths of a line
   4. Perform traverse calculations for balancing latitudes and departures and areas
   5. Recognize terminology, theory, and practice behind topographic surveys
   6. Recognize terminology, theory, and practice behind basic construction surveys
   7. Be familiar with state of the art surveying equipment and techniques

6. *Topics Covered:*
   Measurement errors, field notes, distance measurement, taping, leveling, transit and theodolite, angles, bearings and azimuths, compass, traversing, stadia, topographic surveys, mapping, control surveys, astronomical observations, area computations.

7. *Class/laboratory Schedule, i.e., number of sessions each week and duration of each session:*
   Three 50 minute lecture sessions per week
   (1 co-requisite three hour laboratory session per week)

8. *Contribution of course to meeting the professional component:*
   Course contributes to 4 (b) - Engineering Science

9. *Relationship of course to program objectives:*
   Course contributes to Objective 1 – Engineering Design, and Objective 6 - Professionalism.

10. *Person(s) who prepared this description and date of preparation:*
    Matthew A. Dettman
    3-15-03

Department, number and title of course: CE 161 Surveying Lab

2 *Course (catalog) description:* Field and office procedures in support of material studied in CE 160.

3 *Prerequisites:* High School Algebra & Trigonometry, and AMS 202

4. *Textbook(s) and/or other required material:* None

5. *Course Objectives:*
Upon completion of the course, the student should be able to:
   a. Accurately set up and use a level
   b. Accurately set up and use a theodolite
   c. Accurately set up and use a total station
   d. Take proper field notes
   e. Develop a topographic map
   f. Accurately measure a traverse
   g. Perform traverse adjustment and area calculations

6. *Topics Covered:*
Pacing, chaining, notekeeping, differential leveling, profile leveling, transit operation (vernier), electronic theodolite, compass and pace traverse, closed traverse, stadia, topography, solar shots

7. *Class/laboratory Schedule, i.e., number of sessions each week and duration of each session*
One 3-hour lab session per week
(Two 1-hour 15-minute co-requisite lectures per week)

8. *Contribution of course to meeting the professional component*
Course contributes to 4 (b) - Engineering Science

9. *Relationship of course to program objectives:*
Course contributes to Objective 2 – Project Management, Objective 3 – Communication, Objective 6 – Professionalism, and Objective 7 – Technical Tools.

10. *Person(s) who prepared this description and date of preparation*
Matthew A. Dettman
3-15-03

1. *Department, number and title of course:* CE 304 Construction Management Lab

   Course (catalog) description: Extension of CE 303 lecture course. Skills related to Construction Management will be covered in a laboratory setting including plan reading. specification reading, construction scheduling and estimating using industry standard state-of the-art software and hardware, and other applied tasks.

2. *Corequisites:* CE 303 Introduction to Construction Management

3. *Textbook(s) and/or other required material:* Richard Clough and Glenn Sears, Construction Contracting, 6th edition, Wiley Publishers.

4. *Course Objectives:*
   Upon completion of this course, the student should be able to
   a. Locate required information within a set of construction specifications
   b. Interpret a set of construction drawings to obtain required information
   c. Prepare a quantity take off of basic items such as concrete, interior finishes, and exterior masonry from a set of construction drawings.
   d. Develop and prepare a construction schedule for a project
   e. Recognize the process through which bidding information is produced, advertised, and made available to the bidders.
   f. Incorporate the use of modern tools in the completion of basic construction management tasks.

5. Topics Covered:
   a. Plan reading
   b. Scheduling using critical path techniques and current software
   c. Estimating using traditional and modern methods
   d. Preparation of progress reports
   e. Preparation of cost reports
   f. Interpretation of the CSI Masterformat and project specifications
   g. Overview of standard AIA documents and contracts

6. *Class/laboratory Schedule, i.e., number of sessions each week and duration of each session:*
   One 2-hour lab session per week
   (Three 50 minute co-requisite lectures per week)

7. *Contribution of course to meeting the professional component:*
   Course contributes to 4 (b) - Engineering Science

8. *Relationship of course to program objectives:*
   Course contributes to Objective 2 – Project Management, Objective 6 – Professionalism, and Objective 7 – Technical Tools.

9. Person(s) who prepared this description and date of preparation:
   Matthew A. Dettman
   3-18-03

1. *Department, number and title of course:* CE 316 Equipment and Methods

2. *Course (catalog) description:* Study of construction operations as a dynamic process. Primary topics include earthmoving, optimizing equipment for best production, foundation construction, concrete, masonry and steel construction methods, concrete formwork design, construction safety, and construction productivity. Field trips will be incorporated.

3. *Prerequisites:* CE 303

4. *Textbook(s) and/or other required material:* Nunnally, S.W., Construction Methods and Management, most recent edition, Prentice Hall; Caterpillar Performance Handbook, Current Edition; Tao and Janis, Mechanical and Electrical Systems in Buildings, most recent edition, Prentice Hall.

5. *Course Objectives:*
   Upon completion of this course, the student should be able to:
   a. Perform analysis of soil properties for earth moving operations
   b. Perform optimization analysis of earthmoving operations and equipment
   c. Recognize basic terminology and methodologies of foundation construction
   d. Recognize basic terminology and methodologies of concrete construction
   e. Design concrete formwork
   f. Recognize basic terminology and methodologies of masonry construction
   g. Recognize basic terminology and methodologies steel construction
   h. Recognize basic terminology and methodologies of mechanical and electrical systems
   i. Recognize basic terminology and methodologies of roof systems and insulation

6. *Topics Covered:*
   a. Earthmoving Operations
   b. Foundation Construction
   c. Concrete Construction
   d. Steel Construction
   e. Masonry Construction
   f. Mechanical and Electrical Systems
   g. Interior Finishes
   h. Equipment Selection and Costs
   i. Construction Safety
   j. Field Productivity

7. *Class/laboratory Schedule, i.e., number of sessions each week and duration of each session:*
   Three 50 minute lecture sessions per week

8. Contribution of course to meeting the professional component:
   Course contributes to 4 (b) - Engineering Science

9. *Relationship of course to program objectives:*
   Course contributes to Objective 1 – Engineering Design, and Objective 6 - Professionalism

10. *Person(s) who prepared this description and date of preparation*
    Matthew A. Dettman
    3-17-03

Department, number and title of course CE 326 Engineering Law

2 *Course (catalog) description:* Introduction to law and judicial procedures as they relate to the practicing engineer. Contracts, professional liability, professional ethics, licensing, bidding procedures, intellectual property, products liability. Emphasis on development of critical thinking process, abstract problem analysis and evaluation.

3. *Prerequisites:*
CE 303 – Introduction to Construction Management

4. *Textbook(s) and/or other required material.* Samuels, Brian M., Construction Law, Prentice Hall, current edition.

5 *Course Objectives:*
Upon completion of this course, the student should be able to:
   a. Recognize engineering and construction contract documents
   b. Recognize and classify different types of insurance and bonds
   c. Describe professional liability insurance
   d. Illustrate the use of dispute resolution
   e. Recognize and apply common labor laws

6. *Topics Covered:*
   a. Contract Documents
   b. Conflict of interest
   c. Workers Compensation
   d. Product Warranties
   e. Professional Liability
   f. Negligence
   g. Insurance
   h. Delay Claims
   i. Labor Law
   j. Dispute Resolution
   k. Liens
   l. Bonds

Class/laboratory Schedule, i.e., number of sessions each week and duration of each session
Three 50 minute lecture sessions per week

8. *Contribution of course to meeting the professional component*
Course contributes to 4 (b) - Engineering Science

9. *Relationship of course to program objectives:*
Course contributes to Objective 1 – Engineering Design, and Objective 6 Professionalism

10. *Person(s) who prepared this description and date of preparation*
Matthew A. Dettman
3-18-03

1. *Department, number and title of course:* CE 360 Estimating, Scheduling & Bidding

2. *Course (catalog) description:* Investigates the principles of cost estimating, scheduling, and preparing bid documents for construction projects. Topics include feasibility studies, preliminary and detailed estimating, sequencing of tasks, tracking time and cost, and variance analysis. State-of-the art computer applications for estimating and scheduling will be stressed in the lecture as well as the co-requisite laboratory.

3. *Prerequisites:* CE 303

4. *Textbook(s) and/or other required material:* Dagostino and Feigenbaum, Estimating in Building Construction, Prentice Hall, current edition

5. *Course Objectives:*
   Upon completion of the course, the student should be able to
   a. Recognize the process and tools used in developing a feasibility estimate.
   b. Recognize the impact of bonds, insurance, and other company overhead in the cost estimate
   c. Recognize direct and indirect labor costs in estimating
   d. Recognize and identify major considerations in the estimation of quantities of major construction items such as earthwork, concrete, masonry, and mechanical/electrical systems.
   e. Recognize important issues in evaluating subcontractor bids
   f. Develop a construction schedule
   g. Track the construction schedule and produce progress reports
   h. Develop a bid package based on detailed estimates, subcontractor bids, and a developed schedule

6. *Topics Covered:*
   a. Preliminary estimating
   b. Measuring quantities focusing on major components of heavy and commercial construction
   c. Measuring miscellaneous items
   d. Pricing materials and equipment
   e. Evaluating subcontractors
   f. Identifying and Sequencing tasks
   g. Scheduling tasks
   h. Tracking schedule and cost
   i. Developing a bid
   j. Organizing and presenting the bid

7. *Class/laboratory Schedule, i.e., number of sessions each week and duration of each session:*
   Three 50 minute lecture sessions per week
   (One co-requisite 3 hour laboratory session per week)

8. *Contribution of course to meeting the professional component:*
   Course contributes to 4 (b) - Engineering Science

9. *Relationship of course to program objectives:*
   Course contributes to Objective 1 – Engineering Design, and Objective 6 – Professionalism

10. *Person(s) who prepared this description and date of preparation.*
    Matthew A. Dettman
    3-18-03

Department, number and title of course: CE 361 Estimating, Scheduling & Bidding Lab

2. *Course (catalog) description:* Extension of CE 360 lecture course. Traditional and computer tools will be applied to construction estimating and scheduling. Techniques for quantity take-offs and computer scheduling will be covered.

3. *Prerequisites:* CE 303

4. *Textbook(s) and/or other required material:* None

5. *Course Objectives:*
   Upon completion of the course, the student should be able to:
   a. Perform a feasibility estimate
   b. Develop pricing for company overhead and insurance
   c. Perform quantity estimates and labor costs for major construction items including:
      i. Earthwork
      ii. Concrete
      iii. Masonry
      iv. Metals
      v. Wood
      vi. Electrical
      vii. Thermal and moisture protection
      viii. Plumbing
      ix. HVAC
      x. Finishes
   d. Develop a construction schedule for a project
   e. Develop a bid package based on detailed estimates and subcontractor bids
   f. Utilize state of the art computer tools in estimating and scheduling.

6. *Topics Covered:*
   Laboratory projects will include exercises in quantity estimates and scheduling for major components of commercial and heavy construction. Modern computer techniques will be stressed.

7. *Class/laboratory Schedule, i.e., number of sessions each week and duration of each session.*
   One 2-hour lab session per week
   (Three 50 minute co-requisite lectures per week)

8. *Contribution of course to meeting the professional component.*
   Course contributes to 4 (b) - Engineering Science

9. *Relationship of course to program objectives:*
   Course contributes to Objective 2 – Project Management, Objective 6 – Professionalism, and Objective 7 – Technical Tools.

10. *Person(s) who prepared this description and date of preparation.*
    Matthew A. Dettman.
    3-18-03

1. *Department, number and title of course.* CE 366 Mechanical and Electrical Systems in Buildings

   Course (catalog) description: The fundamental design and installation of M/E systems in buildings. Topics covered include HVAC systems, plumbing and fire protection, electrical principles, equipment and wiring, illumination, environmental control, and plan reading as it relates to the above topics.

3. *Prerequisites:* CE 303

4. *Textbook(s) and/or other required material.* William Tao, Mechanical and Electrical Systems in Buildings, 1997.

5. *Course Objectives:*
   To provide students with a basic understanding of M/E system design with a focus in installation and plan reading and interpretation.

6. *Topics Covered:*
   a. HVAC Fundamentals
   b. HVAC Delivery Systems
   c. Air Handling Equipment
   d. Piping Equipment and Systems
   e. Plumbing Equipment and Systems
   f. Fire Protection and and Systems
   g. Electrical Systems
   h. Lighting
   i. Environmental Control

   Class/laboratory Schedule, i.e., number of sessions each week and duration of each session.
   Three 50 minute lecture sessions per week

8. *Contribution of course to meeting the professional component.*
   Course contributes to 4 (b) - Engineering Science

9. *Relationship of course to program objectives:*
   Course contributes to Objective 1 – Engineering Design, and Objective 6 - Professionalism

10. *Person(s) who prepared this description and date of preparation.*
    Matthew A. Dettman
    3-18-03

Department, number and title of course. CE 370 Materials of Construction

2. *Course (catalog) description:* An introduction to construction materials focusing on aggregate, concrete, masonry, asphalt, timber, and construction materials inspections. Topics will include material properties, applications, production, and physical characteristics. Students will have the opportunity to become Level I certified through the American Concrete Institute.

3. *Prerequisites:* EM 302

4. *Textbook(s) and/or other required material:*
Charles A. Herubin and Theodore W. Marotta, Basic Construction Materials, 5th edition, Prentice-Hall, Inc., 1997.

5. *Course Objectives:*
Upon completion of the course, the student should be able to:
   1. Recognize the types of and application of materials inspection in construction
   2. Recognize the terminology, production process, and use of aggregates as a construction material
   3. Recognize the basic terminology, production process, and application of asphalt
   4. Recognize and apply basic chemistry of cement hydration
   5. Recognize and apply the basic properties of concrete
   6. Develop a concrete mix design to meet a desired specification
   7. Recognize and apply basic terminology, production processes, and application of masonry
   8. Recognize basic terminology, production, and application of wood
   9. Perform all the necessary field tests to achieve ACI Level I Certification.

6. *Topics Covered:*
   a. The construction process and its reliance on construction materials
   b. Production, properties and physical characteristics of:
      1. Aggregate
      2. Cement
      3. Masonry
      4. Asphalt
      5. Timber
   c. Concrete: Chemistry, types, admixtures, testing
   d. Concrete mix design based on ACI 211
   e. ASTM methods for concrete testing
      ACI Level I Certification

7. *Class/laboratory Schedule, i.e., number of sessions each week and duration of each session.*
Two 2-hour lecture sessions per week

8. *Contribution of course to meeting the professional component.*
Course contributes to 4 (b) - Engineering Science

9. *Relationship of course to program objectives:*
   Course contributes to Objective 1 – Engineering Design, Objective 6 – Professionalism, and Objective 7 – Technical Tools

10. *Person(s) who prepared this description and date of preparation:*
    Matthew A. Dettman
    3-17-03

Department, number and title of course: CE 380 Surveying II

2. *Course (catalog) description:* A study of the principles of land surveying. Topics include: boundary descriptions, deeds, horizontal & vertical control, traverse computations, US Public Land Surveys, metes & bounds, property law, partitioning of land, restoring lost corners, right of ways, easements, & minimum standards for boundary surveys.

3. *Prerequisites:* CE 160 and CE 161

4. *Textbook(s) and/or other required material:* Elementary Surveying, An Introduction to Geomatics, 10th edition, Paul R. Wolf & Charles D. Ghilani, Prentice Hall, 2002

5. *Course Objectives:*
   Upon completion of the course, the student should be able to:
   a. Recognize, interpret, and write property descriptions and deeds
   b. Recognize and apply property law as it relates to the practice of surveying
   c. Recognize and apply minimum standards for boundary surveys
   d. Perform traverse calculations including area and adjustment
   e. Recognize the process of subdividing land
   f. Recognize the process of restoring lost corners
   g. Recognize the importance and use of easements and right of ways.

6. *Topics Covered:*
   a. Deed Research
   b. Boundary Descriptions & Deeds
   c. Horizontal & Vertical Control Systems
   d. Traverse Computations
   e. US Public Land Surveys
   f. Metes & Bounds Land System
   g. Property Law
   h. Partitioning of Land
   i. Restoring Lost Corners
   j. Right of Ways & Easements
   k. Minimum Standards for Boundary Surveys

7. *Class/laboratory Schedule, i.e., number of sessions each week and duration of each session:*
   Three 50 minute lecture sessions per week
   (1 co-requisite three hour laboratory session per week)

8. *Contribution of course to meeting the professional component:*
   Course contributes to 4 (b) - Engineering Science

9. *Relationship of course to program objectives:*
   Course contributes to Objective 1 – Engineering Design, as it provides education in a basic civil engineering science.

10. *Person(s) who prepared this description and date of preparation:*
    Matthew A. Dettman
    3-18-03

Department, number and title of course: CE 381 Surveying II Lab

2. *Course (catalog) description:* Field and Office procedures in support of material covered in CE 380.

3. *Prerequisites:* CE 160 and CE 161
   Corequisite: CE 380

4. *Textbook(s) and/or other required material:*
   Instructor provided material

5. *Course Objectives:*
   Upon completion of the course, the student should be able to:
   a. Perform deed research
   b. Locate property corners in the field
   c. Collect boundary data and produce a detailed property drawing
   d. Identify the position of a lost property corner
   e. Perform the stakeout of a new building on a piece of property

6. *Topics Covered:*
   a. Familiarization with computer software SURVCad
   b. Deed research at Warren County Court House on a piece of property
   c. Locate property corners in field on researched deed
   d. Produce a detailed drawing of property using total station and data collector
   e. Topography, property corners, easements, building locations, tree location, etc.
   f. Determination of location of a lost corner on a piece of property
   g. Stakeout a new building on a piece of property
   h. A few field exercises working with a local land surveyor to solve a current land surveying problem encountered in the field

7. *Class/laboratory Schedule, i.e., number of sessions each week and duration of each session:*
   One 3-hour lab session per week
   (Three 50 minute co-requisite lectures per week)

8. *Contribution of course to meeting the professional component:*
Course contributes to 4 (b) - Engineering Science

9. *Relationship of course to program objectives:*
Course contributes to Objective 2 – Project Management, Objective 3 – Communication, Objective 6 – Professionalism, and Objective 7 – Technical Tools.

10. Person(s) who prepared this description and date of preparation:
Matthew A. Dettman
3-18-03

Department, number and title of course: CE 410 Soil Mechanics

2. *Course (catalog) description:* A study of soils and their properties. Stress-strain analysis, horizontal and vertical stress distribution, consolidation and settlement, soil classification, static and dynamic lateral earth pressure, permeability and flow nets, bearing capacity and slope stability.

3. *Prerequisites:* EM 302

4. *Textbook(s) and/or other required material:* Braja Das, Principles of Geotechnical Engineering, current edition, PWS Publishing

5. *Course Objectives:*
   Upon completion of the course, the student should be able to:
   a. Identify soil origins, soil categories, and how soils are classified
   b. Recognize soil is a 3 phase system: solid, liquid, and gas. Be able to calculate soil properties like unit weight, moisture content, void ratio, and degree of saturation.
   c. Recognize what goes into a Geotechnical Investigation and the preparation of a Geotechnical report
   d. Recognize soil compaction processes and equipment and the proper laboratory testing related to field soil compaction.
   e. Recognize how stresses are distributed in a soil mass due to external and internal loads and be able to calculate these stresses.
   f. Recognize how settlement occurs in soil and be able to calculate settlements based on varying loading and soil conditions
   g. Recognize how strength is classified and quantified in soils and how those strength values are used in design.
   h. Recognize and calculate lateral earth pressures in varying types of soils.
   i. Recognize the basics of slope stability analysis and shallow foundation design and be able to perform a very basic slope stability study and spread footing calculation.

6. *Topics Covered:*
   a. Soil composition, structure, and classification
   b. Geotechnical investigations
   c. Soil compaction
   d. Stresses in a soil mass
   e. Settlement
   f. Shear strength of soil
   g. Lateral earth pressures
   h. Foundation design and slope stability

7. *Class/laboratory Schedule, i.e., number of sessions each week and duration of each session:*
   Two 1-hour 15-minute lecture sessions per week
   (One co-requisite 3-hour laboratory session per week)

8. *Contribution of course to meeting the professional component:*
   Course contributes to 4 (b) - Engineering Science

9. *Relationship of course to program objectives:*
   Course contributes to Objective 1 – Engineering Design, and Objective 6 - Professionalism.

10. *Person(s) who prepared this description and date of preparation:*
    Matthew A. Dettman
    3-18-03

Department, number and title of course: CE 41 Soil Mechanics Lab

2. *Course (catalog) description:* The laboratory component of CE 410 – Soil Mechanics. Projects include collection of soil samples in the field, observation of soil drilling and field testing equipment, classification of soils, plasticity testing, liquid limit, plastic limit, standard and modified proctor compaction test, nuclear density testing, and soil strength testing.

3. *Corequisite:* CE 410

4. *Textbook(s) and/or other required material:*
Laboratory assignments provided by instructor.

5. *Course Objectives:*
Upon completion of the course, the student should be able to:
   a. Perform soil classification tests for fine and coarse grained soils
   b. Perform standard and modified proctor compaction tests
   c. Perform consolidation soil tests
   d. Recognize the different types of methods of collecting soil samples in the field
   e. Recognize the different types of field compaction testing methods
   f. Recognize and describe the different types of soil strength tests including direct shear and triaxial testing.
   g. Construct and perform a soil testing program for an engineering project
   h. Apply the results of a soil-testing program in the development of a solution to a real world soil related engineering problem.

6. *Topics Covered:*
   a. Field classification of soils
   b. Sieve analysis
   c. Atterber limits testing: liquid limit and plastic limit
   d. Standard and modified proctor testing
   e. Field compaction testing: nuclear density testing, sand cone, and drive tube field collection of soil samples: standard penetration test, shelby tubes, and other methods
   f. Triaxial testing
   g. Direct shear testing
   h. Consolidation testing

7. *Class/laboratory Schedule, i.e., number of sessions each week and duration of each session:*
One 2-hour lab session per week
(Two 1-hour 15-minute co-requisite lectures per week)

8. *Contribution of course to meeting the professional component:*
Course contributes to 4 (b) - Engineering Science

9. *Relationship of course to program objectives:*
Course contributes to Objective 1 – Engineering Design, Objective 2 – Project Management, Objective 3 – Communication, Objective 6 – Professionalism, and Objective 7 – Technical Tools.

10. Person(s) who prepared this description and date of preparation:
Matthew A. Dettman
3-21-03

Department, number and title of course: CE 416 Construction Administration

2. *Course (catalog) description:* Basic principles of the administration of a construction project. Topics will include office organization preparation of construction documents, project tracking, licensing and permits, financing, banking relationships, and safety policies.

3. *Prerequisites:* CE 303

4. *Textbook(s) and/or other required material:* Edward R. Fisk, Construction Project Administration, 5th edition, Prentice Halll, 1997; Donald S. Barrie and Boyd C. Paulson, Professional Construction Management, 3rd edition, McGraw-Hill, Inc., 1992.

5. *Course Objectives:*
   To introduce the student to the administration of a commercial construction project.

6. *Topics Covered:*
   Administration of a project - lines of command, setting up a field office, documentation and keeping records. Specifications and drawings as they relate to contract administration, construction law and labor relations, construction safety and field safety programs. Field meetings and negotiations, progress payments, change orders, claims and disputes, project close out.

7 *Class/laboratory Schedule, i.e., number of sessions each week and duration of each session:*
   Three 50 minute lecture sessions per week

8. *Contribution of course to meeting the professional component:*
   Course contributes to 4 (b) - Engineering Science

9. *Relationship of course to program objectives:*
   Course contributes to Objective 1 – Engineering Design, and Objective 6 – Professionalism

10. *Person(s) who prepared this description and date of preparation:*
    Matthew A. Dettman
    3-18-03

Department, number and title of course: CE 426 Advanced Construction Materials

2. *Course (catalog) description:* Continuation of CE 370. Topics focus on highway construction and include soil stabilization, bituminous materials and mixtures, general highway materials and construction of rigid and flexible pavements.

3. *Prerequisites:* CE 370

4. *Textbook(s) and/or other required material:* Asphalt Institute Pavement Design Manual.

5. *Course Objectives:*
   To allow students more advanced study of highway, pavement, and asphalt designs and technologies.

6. *Topics Covered:*
   a. Advanced Superpave design
   b. Pavement design / construction integration
   c. Special aggregate applications
   d. Pavement subgrade stabilization
   e. Geotextiles
   f. Overlays
   g. Alternative design criteria - performance vs. strength
   h. Admixtures in asphalt
   i. Recycling in asphalt

7 *Class/laboratory Schedule, i.e., number of sessions each week and duration of each session.*
   Three 50 minute lecture sessions per week

8. *Contribution of course to meeting the professional component:*
   Course contributes to 4 (b) - Engineering Science

9. *Relationship of course to program objectives:*
   Course contributes to Objective 1 – Engineering Design, and Objective 6 – Professionalism

10. *Person(s) who prepared this description and date of preparation:*
    Matthew A. Dettman
    3-18-03

1. *Department, number and title of course:* CE 476 Highway Construction

2. *Course (catalog) description:* An in-depth study of certain phases of highway engineering and construction including geometric design, planning, traffic flow, highway capacity analysis, and economic analysis.

3. *Prerequisites:* CE 370

4. *Textbook(s) and/or other required material:* Policy of Geometric Design of Highways, American Association of State Highway and Transportation Officials, 1990.

5. *Course Objectives:*
This course is a technical elective course and follows CE370. It is designed to provide the student, who is interested in the field of highway construction, an opportunity for an in_depth look at the principles of highway engineering.

6. *Topics Covered:*
   a. History of policies, funding programs, legislation
   b. Urban transportation planning process
   c. Urban traffic congestion and implications for highways
   d. Transportation system management
   e. General travel characteristics
   f. Vehicle operating characteristics
   g. Driver and pedestrian
   h. Use of project planning techniques and cost estimations
   i. Design controls and criteria, environmental issues,
   j. Traffic signs, work zones, speed controls
   k. Cross section elements and other design elements
   l. Bidding and specifications
   m. Construction inspection programs

7. *Class/laboratory Schedule, i.e., number of sessions each week and duration of each session:*
Three 50 minute lecture sessions per week

8. *Contribution of course to meeting the professional component:*
Course contributes to 4 (b) - Engineering Science

9. *Relationship of course to program objectives:*
Course contributes to Objective 1 – Engineering Design, and Objective 6 - Professionalism.

10. *Person(s) who prepared this description and date of preparation:*
Matthew A. Dettman
3-18-03

Department, number and title of course: CE 480 Surveying III

2. *Course (catalog) description:* A study of advanced principles of surveying. Topics include: astronomical observations, Global Positioning System (GPS), state plane coordinate system, adjustment and calibration of equipment, three-wire leveling, advanced application using computer software, triangulation, trilateration, resection problems, legal principles of surveying.

3. *Prerequisites:* CE 380 and CE 381

4. *Textbook(s) and/or other required material:* Elementary Surveying, An Introduction to Geomatics, 10th edition, Paul R. Wolf & Charles D. Ghilani, Prentice Hall, 2002

5. *Course Objectives:*
Coverage of current state of the art surveying and measurement practices

6. *Topics Covered:*
This course will be utilized to cover the most advanced topics in surveying and measurement. Topical coverage will reflect current state of the art practices.

7. *Class/laboratory Schedule, i.e., number of sessions each week and duration of each*
Three 55-minute lecture sessions per week
(1 co-requisite three hour laboratory session per week)

8. *Contribution of course to meeting the professional component:*
Course contributes to 4 (b) - Engineering Science

9. *Relationship of course to program objectives:*
Course contributes to Objective 1 – Engineering Design, and Objective 6 - Professionalism.

10. *Person(s) who prepared this description and date of preparation.*
Matthew A. Dettman
3-18-03

1. *Department, number and title of course:* CE 481 Surveying III Lab
2. *Course (catalog) description: :* Field and Office procedures in support of material covered in CE 380

3. *Prerequisites:* CE 380 and CE 381

4. *Textbook(s) and/or other required material:* Instructor provided material

5. *Course Objectives:*
   Coverage of current state of the art surveying methods including advanced techniques, GPS, GIS, and construction surveying.

6. *Topics Covered:*
   This course will be utilized to cover the most advanced topics in surveying and measurement. Topical coverage will reflect current state of the art practices.

7. *Class/laboratory Schedule, i.e., number of sessions each week and duration of each session*
   One 3-hour lab session per week
   (Two 1-hour 15-minute co-requisite lectures per week)

8. *Contribution of course to meeting the professional component*
   Course contributes to 4 (b) - Engineering Science

9. *Relationship of course to program objectives:*
   Course contributes to Objective 2 – Project Management, Objective 3 – Communication, Objective 6 – Professionalism, and Objective 7 – Technical Tools.

10. *Person(s) who prepared this description and date of preparation:*
    Matthew A. Dettman
    3-18-03

Department, number and title of course: CE 486 Steel and Concrete Construction

2. *Course (catalog) description:* Planning and field engineering for concrete and steel construction. Design and applications of concrete formwork to construction. Erection of structural steel. Safety and Building Codes.

3. *Prerequisites:* CE 316.

4. *Textbook(s) and/or other required material:* Cameron Andres, Principles and Practices of Heavy Construction, Prentice Hall, 1998.

5. *Course Objectives:*
   To provide the student an in-depth study of the construction of steel and concrete structures.

6. *Topics Covered:*
   a. Steel Building
   b. Steel erection
   c. Bolts and welds
   d. Hoisting of steel members
   e. Shop drawings
   f. Inspection
   g. Concrete Buildings
   h. Erection of precast concrete members
   i. Shop drawings
   j. Inspection
   k. Safety

7. *Class/laboratory Schedule, i.e., number of sessions each week and duration of each session.*
   Three 50 minute lecture sessions per week

8. *Contribution of course to meeting the professional component.*
   Course contributes to 4 (b) - Engineering Science

9. *Relationship of course to program objectives:*
   Course contributes to Objective 1 – Engineering Design, and Objective 6 - Professionalism.

10. *Person(s) who prepared this description and date of preparation.*
    Matthew A. Dettman
    3-18-03

1. *Department, number and title of course:* CE 498 Senior Project

2. *Course (catalog) description:* Students, working on a multi-disciplinary civil engineering team, will develop, design, test, and ultimately build a civil engineering project. The project will be such that multiple options must be considered and multiple solutions are available. Both analysis and synthesis will be used culminating in a final product. Teamwork will be stressed. Major considerations during the entire process should include ethics, economics, manufacturability, social impact, political, and environmental health and safety. State of the art tools will be utilized in all phases of the project.

3. *Prerequisites:* Senior standing.

4. *Textbook(s) and/or other required material:* None

5. *Course Objectives:*

To provide the students a capstone design experience in which they can bring together their problem solving and project management skills.

6. *Topics Covered:*

Students will work in teams to finish a semester long project. They will provide progress reports, project and budget tracking, peer evaluations, periodic written and oral presentations as required by the project, and a final presentation detailing the project and results utilizing written, oral visual and graphical communication skills.

7. *Class/laboratory Schedule, i.e., number of sessions each week and duration of each session:* Two hour and 15-minute meeting sessions per week

8. *Contribution of course to meeting the professional component:*

Course contributes to 4 (b) - Engineering Science

9. *Relationship of course to program objectives:*

Course contributes to Objective 1 – Engineering Design, Objective 2 – Project Management, Objective 3 – Communication, Objective 4 – Professionalism, and Objective 7 – Technical Tools.

10. *Person(s) who prepared this description and date of preparation:*

Matthew A. Dettman

3-18-03

Attachment 5. WKU-UK Civil Engineering Admission Standards.

WKU-UK Joint Bachelor of Science Program in Civil Engineering

Admission Standards

Admission to Western Kentucky University

1. Students are admitted to Western under the institutional standard, which currently requires completion of the pre-college curriculum, a minimum high school GPA of 2.5, and a minimum composite ACT of 20.

2. Students are not directly admitted into any major of the University. If a student expresses an interest in a specific major, then that student will be assigned an advisor from that area and will be put in an appropriate section of the University introductory course, UC 101, but the student is identified as a pre-major until certain specified courses are completed.

Filing a Degree Program

1. A student transitions from pre-major upon completion of a specified portion of curriculum. Required are a minimum of 24 hours, including UC 101, ENG 100, HIS 119 or 120 COMM (Speech Communications) 145 or 161, and a mathematics course. Additional requirements are specified for each major for a minimum total requirement of 24 hours. A department may also specify a required grade point average. The CE programmatic requirements are given below.

2. Students are expected to meet the pre-major requirements within the first 48 hours of degree credit and are expected to file a degree program (this is primarily a curricular "roadmap" or plan for the student), in a specified major after 60 hours (junior status).

3. Students will be eligible to file a degree program when they complete the first-tier courses defined in the table below with a grade of "C" or better in each and a cumulative GPA of 2.5 in all Tier 1 courses.

List of Tier 1 Pre-Major Courses for Civil Engineering

Tier 1 Course	Credits	Tier 1 Course	Credits
GEOL 111/113	4.0	ENG 100	3.0
HIST 119 or 120	3.0	MATH 227	4.5
MATH 126	4.5	PHY 250/251	4.0
UC101	2.0	COMM 161 OR 145	3.0
Subtotal	13.5	**Subtotal**	14.5
TOTAL TIER 1 PRE-MAJOR CREDITS			**28.0**

Engineering Standing in the Joint WKU/UK CE Program

Formal admission to "engineering standing" in civil engineering would occur after students complete the core civil engineering courses listed in the table below. In order to earn Engineering Standing, students should earn a C or better in each of the core civil engineering courses with a cumulative GPA of 2.5 or better.

Core Courses for Civil Engineering Standing

Course	Credits	Course	Credits
[illegible]	3.0	ENG 100	3.0
[illegible]	4.0		
UC101	2.0	CHEM 120/121E	5.0
MATH 126	4.5	GEOL 111/113	4.0
MATH 227	4.5		
MATH 327	4.0	PHY 250/251	4.0

Repeat Options and Request for Waivers

Use of official repeat options can be used to improve grades in the core courses, with a limit of repeats as allowed by WKU. Student requests for a waiver will be considered upon petition to the joint program faculty provided a minimum core GPA of 2.25 has been earned. Recommendations on the petition will require a majority vote of the joint program faculty.

NOTE: Any student eligible to file for a degree program prior to May 2004 may petition for waivers of specific core requirements. Recommendations related to the petition must be approved by a majority vote of the joint program faculty.

Similarly, a student may petition for a waiver of course prerequisites if enrolled prior to May 2004. Recommendations related to the petition must be approved by a majority vote of the joint program faculty. Subsequently, students will be required to adhere to course prerequisites.

WKU.CE.admission

Note: For comments regarding Engineering Standing and Repeat Options, refer to pages 1 of 3 and 2 of 3 of the May 30, 2003 Memorandum from Harik to Dettman. The memorandum follows this page.

UK Univers
COLLEGE OF ENGINEERING

Department of Civil Engineering
161 Raymond Bldg.
Lexington, KY 40506-0281
Office: (859) 257-4856
Fax: (859) 257-4404

MEMORANDUM

TO: Matt Dettman

FROM: Issam Harik

RE: Joint WKU/UK CE Degree Program

DATE: May 30, 2003

The UK Civil Engineering Education Team met on Tuesday, May 6 to discuss the proposal submitted by Associate Dean G.T. Lineberry on the Joint WKU/UK Civil Engineering Degree Program. This is one of the steps in the process to obtain approval of the proposed joint degree program.

A number of questions were raised at this meeting. Some of the questions focused on the Engineering Standing Criteria to be implemented in the joint degree program. The following description has been proposed by the Education Team prior to submission to the UK CE faculty in Fall 03. I would like to solicit the input from the WKU CE faculty on this issue as well as address the subsequent questions prior to submission to the CE Faculty. Your response by the first week in August 2003 is appreciated so that the UK CE faculty can vote and forward its recommendation to the College of Engineering.

Engineering Standing in the Joint WKU/UK CE Program

Formal admission to "engineering standing" in civil engineering can occur by application after students complete the core civil engineering courses listed in the table below. In order to earn Engineering Standing, students are required to earn a C or better in each of the core civil engineering courses with a cumulative GPA of 2.5* or better in the listed core classes.

Deleted: would

Deleted: should

Core Courses for Civil Engineering Standing

Course	Credits	Course	Credits
AMS 202	3.0	ENG 100	3.0
CE 160/161	4.0		
UC101	2.0	CHEM 120/121E	5.0
MATH 126	4.5	GEOL 111/113	4.0
MATH 227	4.5		
MATH 327	4.0	PHY 250/251	4.0

Repeat Options and Request for Waivers

*Use of official repeat options can be used to improve grades in the core courses, with a limit of repeats as allowed by WKU.

Students who do not meet the listed entrance requirements for Engineering Standing but have achieved a core GPA of 2.25* or higher may request a review of the application by the Department of Civil Engineering Exceptions Committee. Reviews will be conducted in January and August. If a majority of the committee decides against the applicant request, but remedial action could improve the applicant's chances of success, then the committee chair will so state and the Department will forward the recommendation(s) to the applicant.

A student may apply twice for Engineering Standing. If a student is denied Engineering Standing after two applications, the student will be terminated from the Civil Engineering Program.

NOTE: Any student eligible to file for a degree program prior to May 2004 may petition for waivers of specific core requirements. Recommendations related to the petition must be approved by a majority vote of the joint program faculty.

Similarly, a student may petition for a waiver of course prerequisites if enrolled prior to May 2004. Recommendations related to the petition must be approved by a majority vote of the joint program faculty. Subsequently, students will be required to adhere to course prerequisites.

Deleted: Student requests for a waiver will be considered upon petition to the joint program faculty provided a minimum core GPA of 2.25 has been earned. Recommendations on the petition will require a majority vote of the joint program faculty.¶

Curriculum sheet question:

a. Is there any plan to offer separate steel and concrete courses.
b. Can students take Dynamics and other non-CE tech electives?

Course questions:

CE 326 Engineering Law: In item 9, it is stated that the course will contribute to Objective 1 – Engineering Design. Please elaborate briefly on the contribution.

CE 360 Estimating, Scheduling and Bidding: In item 8, it is stated that the course will contribute to 4(b) – Engineering Science. Please elaborate briefly on the contribution.

CE 366 Mechanical and Electrical Systems: The course has CE 303 as a prerequisite. Should Physics (and possibly Thermo?) be added as a prerequisite?

CE 370 Materials of Construction: This is a 3-credit hour course and under item 7 it is listed that "Two 2-hour lecture sessions per week" for a total of four hours of lecture. In item 5.9, it is statesd that "Perform all necessary field tests to achieve ACI Level I Certification". Should the course be divided into a 2-cr hr of lecture and 1 cr hr of lab? Or other combination of lecture + lab.

CE 416 Construction Administration: In item 8, it is stated that the course will contribute to 4(b) – Engineering Science. : In item 9, it is stated that the course will contribute to Objective 1 – Engineering Design. Please elaborate briefly on the contribution.

CE 476 Highway Construction: CE 370 is a prerequisite. However, the topics covered in CE 470 do not rely on the material covered in CE 370. Please elaborate.
The textbook for CE 476 is dated 1990. Is there a more recent edition?

CE 480 Surveying III: Please list the topics the topics for this course?

CE 498 Senior Project: In item 8, it is stated that the course will contribute to 4(b) – Engineering Science. Please elaborate briefly on the contribution.
If CE 498 is the Capstone Design Course, please provide a brief description of the types of projects for this course.

Technical Electives: Please provide a listing of Technical Electives in addition to the Surveying and Construction electives.

ATTACHMENT 6

ADDENDUM TO THE FRAMEWORK

JOINT ENGINEERING PROGRAM
UNIVERSITY OF KENTUCKY
WESTERN KENTUCKY UNIVERSITY

1. The agreements described herein apply to the joint programs in civil and mechanical engineering offered by the University of Kentucky (UK) and Western Kentucky University (WKU).

2. UK Engineering faculty will teach a minimum of 16 hours of any level engineering course work to each student who graduates from the program.

3. WKU faculty may be jointly appointed as graduate faculty at UK, and UK faculty may be jointly appointed as graduate faculty at WKU. WKU faculty who are jointly appointed as graduate faculty at UK may teach courses in UK's University Scholars program to meet teaching loads.

4. WKU students who are admitted to the University Scholars program will receive graduate credit for these courses.

5. The Accreditation Board for Engineering and Technology (ABET) and the Council on Postsecondary Education (CPE) will organize a mock accreditation visit to be held in May 2004.

6. The authority to make decisions on the joint program curriculum, including course curriculum and educational content, will reside with the joint program faculty. Curriculum changes for courses that do not reside in the Department of Engineering at WKU or the Departments of Mechanical and Civil Engineering at UK may need to be routed through normal college and university level committees.

7. Joint program faculty, which will be equally represented by UK and WKU, will resolve conflicts by use of the "possession arrow" method which comes into play when votes among the joint program faculty are deadlocked. In accordance with a coin toss held December 8, 2003, the possession arrow will start with UK.

8. Any decision resolved by the "possession arrow" method will not be implemented for 30 days. The Joint Program Steering Committee may review such decisions during the 30-day period.

9. Amendments or modifications of this memorandum of agreement may be made by mutual written agreement of the Presidents of UK, WKU, and CPE and the Engineering Deans at UK and WKU.

UNIVERSITY OF KENTUCKY

Lee T. Todd, Jr., President — Date 3/5/04

Thomas W. Lester, Engineering Dean — Date 3/5/04

WESTERN KENTUCKY UNIVERSITY

Gary A. Ransdell, President — Date 1/9/04

Blaine R. Ferrell, Dean
Ogden College of Science and Engineering — Date 1-9-04

COUNCIL ON POSTSECONDARY EDUCATION

Thomas D. Layzell
President — Date

UNDERGRADUATE COUNCIL 3-9-2004

Draft Budget[1]
University of Kentucky - Western Kentucky University Civil & Mechanical Engineering Programs
and
Murray State University Environmental Engineering Program
August 30, 2001

University of Kentucky - Western Kentucky University Civil & Mechanical Engineering

	Start-up 1/01-6/01	Start-up 7/01-12/01	Start-up 1/02-6/02	Budgeted 7/02-6/03	Budgeted 7/03-6/04
1. Faculty					
a. Additional full-time faculty at UK (cumulative)				2	4
b. Avg. starting salary Asst Prof plus 21% fringe benefits[2]				150,000	
c. Cost of additional faculty (program development)		10,000	20,000		
d. Faculty start-up costs[3]				150,000	155,000
2. Administration					
a. 20% time Assoc Deans, plus 21% fringe benefits	14,097	14,520	15,100	30,200	31,408
b. 10% time CE & ME Chair plus 21% fringe benefits		14,520	15,100	30,200	31,408
3. Staff					
a. Professional staff - video production/program administration[4]	15,375	15,836	16,311	33,600	34,608
b. Clerical staff - video production/administration[5]	7,687	7,917	8,155	16,799	17,303
c. Teaching Asst (1/2 per faculty member at $18,000/yr per TA)				18,000	37,440
4. Other Personnel					
a. Consultants[6]		1,200	2,400		2,400
Total Personnel Costs	$51,256	$63,993	$77,066	$428,799	$622,567
5. Operations					
a. Administrative Supplies	4,000	4,000	8,000	8,000	8,000
b. Travel/faculty Lodging	3,000	3,000	10,000	15,000	15,000
c. Postage, Telephone, Printing	1,800	1,800	3,600	7,200	7,200
d. Video Supplies			800	1,600	1,600
e. Other Instructional Expenses			3,500	6,000	6,000
Total Operating Costs	$8,800	$8,800	$25,900	$37,800	$37,800
6. Capital Costs					
a. Miscellaneous Video Equipment			$2,500	$5,000	$5,000
Total Costs - Nonrecurring	$0	$1,200	$4,900	$155,000	$163,400
Total Costs - Recurring	$60,056	$71,593	$100,566	$316,599	$501,967
Total Costs	$60,056	$72,793	$105,466	$471,599	$665,367

[1]It is assumed that UK will deliver one 3-hour course at WKU in spring semester 2002, two 3-hour courses in the fall semester 2002, and thereafter UK faculty will deliver 21-24 hours per year in each discipline

[2]Entry-level faculty member with 9-month apointment (including fringe benefits) teaching 12 credit hours per year

[3]Based on most recent CE & ME engineering start-up packages requested by entry-level faculty members

[4]Market grade estimated to be $50k annual salary for professional/administrative position (including fringe benefits)

[5]Administrative assistant (including fringe benefits)

[6]Consultation visits by ABET certified program evaluators of CE & ME programs and distance learning consultants

[7]Preparing for ABET accreditation - documentation and assessment

Attachment 7. Proposed Budget