UNDERGRADUATE CURRICULUM PROPOSAL COVER SHEET

Title of Proposal – Must begin with Department Abbreviation:

---

BSCE - New Program

Check One: ☑ Full Proposal or ☐ Information Item

Effective Date for Curricular Offering: FALL 2009

FROM: Civil Engineering Program/Joseph Owino, 440A EMCS, X4316, Joseph-Owino@utc.edu
(proposal originator: include spokesperson's name, department, office number, telephone, e-mail)

Does this require new resources from the originating department or other department? ____________
Please attach explanation if yes.

Faculty of the originating department approved this proposal on 11/05/2008 (date),
by a vote of 3 aye votes; 0 nay votes; 0 abstentions; 0 eligible voting members absent

The following have examined this proposal:

Dept Head/Director: Gary McDonald (printed name) [signature] approve neutral disapprove

College Curriculum Committee Date: 11/7/08 Vote: 4 yes 0 no Signature of Chair: [signature]

Spokespersons for Affected Departments:

JOSEPH OWINO/CE/11/07/08 [signature] approve neutral disapprove
(name, department, date)

(name, department, date) [signature] approve neutral disapprove

(name, department, date) [signature] approve neutral disapprove

(name, department, date) [signature] approve neutral disapprove

Dean/Director: [signature] approve neutral disapprove

University Registrar: Linda Orth [signature] Comments:

Provost: Phil Oldham (printed name) [signature] approve neutral disapprove

*Those who disapprove may attach an explanation

**ACTIONS on this proposal:**

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<thead>
<tr>
<th>Curriculum Committee</th>
<th>Faculty Senate</th>
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<tr>
<td>Date the proposal was considered</td>
<td></td>
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<tr>
<td>Vote of the body:</td>
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<tr>
<td>Accepted as information item (indicate date)</td>
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<tr>
<td>Approved as submitted (indicate date)</td>
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<tr>
<td>Approved with amendments (amendments indicated and transmitted to all signatories above, date):</td>
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<td>Signature of Chair:</td>
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Revised 2/16/2007
I. PROPOSAL FOR THE INITIATION OF A
NEW DEGREE PROGRAM

Submitted by
University of Tennessee at Chattanooga
Institution Submitting Proposal

College of Engineering and Computer Science
Name of College, School, or Division

Civil Engineering
Name of Department/Academic Unit

A NEW PROGRAM LEADING TO THE DEGREE OF:

Bachelor of Science in Civil Engineering
Title of Degree as on Diploma

Civil Engineering
Title of Major

14101/UTC Code 2312
CIP/THEC Code

BSCE
Formal Degree Abbreviation

Bachelor of Science in Civil Engineering
Degree Designation on Student's Transcript

Fall 2009
Proposed Starting Date
II. ABSTRACT

DEGREE PROGRAM

Institution: University of Tennessee at Chattanooga

Division/Department, etc. Civil Engineering

Program leading to Degree of: Bachelor of Science in Civil Engineering
With a Major in: Civil Engineering

With Sub-Majors in: None

Proposed Start-up Date: Fall 2009  Total Credit Hours Required for Major: 128

New Courses Proposed: NONE

Number of New Courses: NONE  Number of New Course Credit Hours: NONE

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<th>Fall Part-Time Headcount</th>
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<th>Graduates</th>
<th>FTE Faculty</th>
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New Costs Generated by Program:

Year 1  NONE
Year 2  NONE
Year 3  NONE
Year 4  NONE
Year 5  NONE

Accrediting Organization: Accreditation Board for Engineering and Technology

Target Date for Accreditation: Full Six Year Period Granted in Fall 2008
RATIONALE FOR PROPOSAL

HISTORY
The Engineering program at UT Chattanooga began in 1969 with approval to grant Bachelor of Science in Engineering (BSE) degrees to graduates of a multidisciplinary academic program with "Concentrations" in various engineering disciplines. The program was accredited by the Accreditation Board for Engineering and Technology (ABET) as a "non-traditional" program in 1975. Over the next two decades the program grew steadily by establishing a niche for multidisciplinary engineering education that differentiated UT Chattanooga from more mature programs at other institutions. However, beginning in the early 1990's, engineering graduates from UT Chattanooga began to experience difficulties, particularly when seeking employment outside the immediate area of Chattanooga. Most corporate recruiters were seeking traditional engineers with discipline specific degrees. For a time, the College was able to argue that a multidisciplinary approach produced better prepared engineering graduates. During this period, the size and scope of the engineering programs at UT Chattanooga were also limited by constrained classroom space and barely adequate laboratory space. These constraints were removed with the construction in 2003 of the new Engineering Mathematics and Computer Science Building. However, the difficulties experienced by UT Chattanooga graduates did not go away and the College soon began to experience difficulty in convincing prospective students and their parents that earning a general BSE degree was better than earning a discipline specific degree. In response, the faculty began moving toward discipline specific degree programs in the late 1990's. By 2001, a revised civil engineering curriculum was in place and students were enrolled in the new program. In 2003 all existing BSE degree programs were reviewed by ABET in a regularly scheduled visit for continued accreditation as "non-traditional engineering programs." In addition, two programs, electrical engineering and mechanical engineering, were reviewed as stand-alone, traditional programs. In fall 2004 ABET reaccredited all existing BSE Engineering program while also granting full accreditation for the new electrical and mechanical engineering programs as discipline specific programs. In 2007 two additional programs, civil engineering and chemical engineering were reviewed as stand-alone, traditional programs. In fall 2008 ABET granted full accreditation for the new civil and chemical engineering programs as discipline specific programs. The best possible outcome from ABET is the designation of "next general review" that certifies accreditation for a period of six years without an interim visit or report. The new discipline specific civil engineering program, received full accreditation until the "next general review" that will occur in 2013.

REQUEST FOR DEGREE CHANGE
The College of Engineering and Computer Science requests approval to change the name of the degree offered to graduates of the newly accredited civil engineering program from Bachelor of Science in Engineering (BSE) to Bachelor of Science in Civil Engineering (BSCE).
III. PROGRAM DESCRIPTION

A.1 MISSION:
The educational objectives of the CE program are based on and consistent with the missions of the University and the College of Engineering and Computer Science. The mission of The University of Tennessee at Chattanooga is to serve as a national model of an engaged metropolitan university whose faculty, staff, and students, in collaboration with external partners, employ the intellectual resources of the liberal arts and professional programs to enrich the lives of those we serve. The Mission of the College of Engineering & Computer Science is to serve the people, businesses, and industries of our region and support their technical needs. The College exists as the region’s principal resource for educational, applied research, and service programs. The mission of the CE Program is to provide students in civil engineering with the knowledge and skills required for a wide range of careers and graduate study; to provide service to the profession in our region and beyond; and to maintain a supportive environment that encourages our students and faculty to achieve.

A.2 PROGRAM OBJECTIVES:
Consistent with the missions of the University, the College of Engineering and Computer Science, the CE Program and the ABET/ASCE (American Society of Civil Engineers) Program Criteria for Civil Engineering, the educational objectives for the undergraduate program in civil engineering are to produce graduates who:

1. Have the ability to function as civil engineers.
2. Agree that UTC was conducive to their achieving.
3. Work effectively in multidisciplinary teams.
4. Are progressing toward professional registration.
5. Participate in professional societies.
6. Pursue graduate studies.

These objectives are consistent with the missions of the University, the College and the CE program because the knowledge, competencies, skills, attitudes and preparations that flow from our supportive, interdisciplinary, design oriented program.
B. CIVIL ENGINEERING CURRICULUM

B.1 CATALOG DESCRIPTION: The civil engineering program prepares civil engineering students for successful careers in industry and academia, and provides service to the civil engineering profession and to the State of Tennessee.

The civil engineering curriculum offers courses four discipline areas: Structures, Geotechnical Engineering, Transportation Engineering and Environmental Engineering. The civil program faculty has degrees in various emphasis areas of civil engineering and is committed to delivering a civil engineering curriculum that has strong emphasis on engineering analysis tools, utilization of modern, electronic instrumentation culminating with a civil engineering and interdisciplinary design experience.

B.2 COURSE REQUIREMENTS

General Education Courses

Rhetoric and Composition: English 121, 122 (6 hours)
Mathematics: Math 151/152 (4 hours)
Statistics: Engineering 222 (3 hours)
Natural Sciences: Two approved natural science courses, at least one including a laboratory component (7-8 hours)
Humanities and Fine Arts: One approved fine arts course and one approved humanities course (6 hours)
Cultures and Civilizations: One approved non-western cultures and civilizations course (3 hours)
Behavioral and Social Sciences: Economics 101 and 102 or two approved behavioral science courses (6 hours)

Major and Related Courses

Chemistry 121/123
Mathematics 151/152, 161/162, 212, 245, 255
Physics 231/281
Note: For qualified students, ENGR 495r, Departmental Honors (4 hours) may substitute for ENCE 450 (3 hours)
Civil Engineering Courses ENCE 340, 361, 362, 363, 368, 450, 461, 462, 463, 468
ENEV 331, 438, Geology: Geology 445
Technical electives: Two 3-hour 300-level or 400-level courses in approved engineering courses

128 hours (138 for co-op graduates).
Minimum 39 hours at the 300-400 level.
2.0 GPA in all engineering courses.

B.3 TYPICAL CIVIL ENGINEERING CURRICULUM

The typical Civil Engineering curriculum is shown in Tables 1 through 3.
<table>
<thead>
<tr>
<th>Year; Semester</th>
<th>Civil Engineering Program</th>
<th>Category (Credit Hours)</th>
<th>Math &amp; Basic Sciences</th>
<th>Engineering Topics Check if Contains Significant Design (✓)</th>
<th>General Education</th>
<th>Other</th>
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<td><strong>Year 1 1st Semester</strong></td>
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<td>ENGR 103 Basic Engineering Science</td>
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<td>ENGR 185 Introduction to Engineering Design</td>
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Table 3: Basic-Level Curriculum Civil Engineering Program (continued)

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</table>

OVERALL TOTAL FOR DEGREE: 128 hrs

PERCENT OF TOTAL: 100% 27.3% 56.3% 16.4% 0%

Totals must satisfy one set:
- Minimum semester credit hours: 32 hrs 48 hrs
- Minimum percentage: 25% 37.5%

B.4 COURSE DESCRIPTIONS FOR NEW COURSES PROPOSED

Most of the courses noted in the civil engineering curriculum have been taught since 2001. No new courses are proposed.
C. EVALUATION – The process described below was developed to support the ABET accreditation process completed in fall 2007. Information will be presented to demonstrate that the CE program is being evaluated by appropriate representatives and organizations with feedback being used to support program improvement. The CE faculty will be responsible for conducting the assessment process, analyzing the results, and providing feedback to the CE program constituents.

C.1 PROGRAM CONSTITUENCIES
The Civil Engineering program objectives (attributes we expect our graduates to possess three to five years after graduation) and outcomes (attributes our graduates must demonstrate upon graduation) reflect the values of our four most immediate constituencies:

- Civil Engineering Advisory Board
- Civil Engineering alumni
- Civil Engineering professional society (ASCE)
- Civil Engineering faculty.

The CE Advisory Board is made up of engineers, engineering managers, alumni and business managers representing local, regional, and national employers of civil engineers. As such the Board provides valuable feedback regarding our program based on their observations of our students through the UTC co-op experience, through capstone student design project partnerships and through their experiences in the hiring, training and employing our graduates. The CE Advisory Board also represents local, regional, and national collaborators in ongoing faculty research.

Alumni of the CE program provide important reflections of the content, completeness and quality of the CE program; reflections based in large measure on their own professional and career experience. Alumni also support the CE program financially, hire our graduates and participate in student design project partnerships. There are approximately 225 active CE alumni from the old CE specialty program and the new CE program.

The members of the local chapter of ASCE (American Society of Civil Engineers) are comprised of active and retired civil engineering professionals and CE faculty. The chapters provide insight to promoting and enhancing the technical competency and professional well-being of civil engineers.

The CE faculty members possess an abundance of professional and academic experience essential to articulating and implementing the program mission and objectives and to sustaining the process of continuous program improvement.

Process to Establish and Review Program Educational Objectives
The process to establish the program and educational objectives of the CE program had its genesis in the 1999 revision of the College's strategic plan. Input for the revision of the
College mission, objectives and the strategic plan flowed from the College Advisory Board, industrial partners, recruiters and alumni. In 2000, subcommittees of the faculty developed and the full faculty of the College approved the strategic plan with its revised mission and objectives and the set of strategies for improving the College and its programs over the next five years. A principal component of the improvement strategy was the shift from the ‘non-traditional’ engineering program to discipline based programs.

The development of the Civil Engineering program began in the fall of 2001 by articulating the program’s mission and educational objectives. This process incorporated the input of the College Advisory Board at the annual College Advisory Board retreat. With the advice and support of this important constituent, the CE faculty subsequently crafted a mission statement and a set of educational objectives. The CE Advisory Board met in April 2003, April 2004, April 2005, November 2006, March 2007 and June 2007 to review the Mission statement, Program Objectives and Outcomes. The Advisory Board strongly endorsed these statements and the Program’s seeking accreditation for the civil engineering program. The Advisory Board strongly endorsed the comprehensive nature of the CE program objectives and recommended that an emphasis be placed on economic considerations.

The CE Advisory Board was asked to complete a survey on the relative importance of CE program skills and knowledge that they want our CE program graduate to have (called CE program Outcomes later). Table 4 summarizes the Advisory Board’s most recent 2007 survey. The survey questionnaire is shown in Figure 1. The survey contains a number of questions that are relevant to the six CE educational objectives.

Educational Benchmark, Inc. (EBI) produces a standardized, national survey that is administered to alumni who graduated at engineering schools throughout the United States. In the spring of 2007, the civil engineering program used the EBI assessment tool to survey alumni (graduates for period 2000 to 2004). While the respondents were graduates with civil engineering concentrations, and while none was a graduate of the newly developed discipline based program, the survey results indicate the program objectives most representative of the CE program seeking accreditation.

The survey questionnaire is shown in Figures 2 and 3. The survey contains a number of questions that are relevant to the six CE educational objectives. The survey is scored by EBI, who also provides UTC with information collected from other participating schools, thus allowing some inter-institutional comparison. The overall result of the 2007 EBI CE assessment survey is summarized in Table 5.
Advisory Board Survey
The University of Tennessee at Chattanooga (UTC)
College of Engineering and Computer Science
Civil Engineering Program

The Civil Engineering program at UTC has adopted a process of assessment that involves measuring the effectiveness of the program in achieving educational objectives that support its mission. As part of this assessment effort we are asking you to complete this survey. We seek your candid evaluation of those individuals in your organization who are graduates of UTC's undergraduate civil engineering program. This survey allows you to provide an aggregate evaluation of these individuals.

The survey consists of two parts. Part 1 provides us a record of where our graduates are working and the programs they support. Part 2 provides us feedback as to how our graduates are performing in your organization. Please respond to both parts of the survey.

Thank you for participating in the Civil Engineering Program assessment process. We appreciate your contribution and your time.

Part I: Please complete the following so we can recognize where and for whom our graduates work.

Name: ____________________________ e-mail: ____________________________
Organization and Company: ____________________________________________
Approximate # of employees you manage: ________________________________
Approximate # of UTC CE alumni you manage: ____________________________

Part II: For the aggregate of the UTC CE graduates who report to you, please respond to each of the following based on the given 7 point scale. Circle the most representative response.

<table>
<thead>
<tr>
<th>UTC CE graduates</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. demonstrate the ability to design a system, component, or process to meet desired needs</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2. demonstrate effective mastery of technical skills</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3. demonstrate interpersonal skills necessary to succeed</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4. effectively function in multidisciplinary environments</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>5. easily adapt to various environments</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>6. adapt effectively to changing environments</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>7. actively pursue continued education</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>8. pursue graduate work</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>9. have passed the PE exam and are progressing toward P.E. registration</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>10. demonstrate effective written communication skills</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>11. demonstrate effective oral communication skills</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>12. enhance the effectiveness of your organization</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>13. demonstrate ability to use reference materials to support project design</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>14. demonstrate ability to understand ethical responsibility</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>15. demonstrate ability to understand the impact of engineering solutions in a global/societal context</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>16. meet a high level of overall satisfaction</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Figure 1 CE Advisory Board Survey Questionnaire, page 1 of 1.
EBI Engineering Alumni Assessment

Please record your responses by carefully darkening the circle that corresponds to your answer with a #2 pencil or black ink. (no mechanical pencils). One response per item.

College/University: ________________________________

(Please Print Clearly)

A. Population Code (leave blank if not provided):

   1  2  3  4  5  6  7  8  9  10

B. Gender:
   □ Male  □ Female

C. U.S. Ethnic Group or Nationality:
   □ Multiracial American  □ Hispanic American
   □ African American  □ White American
   □ Native American  □ Non-U.S. Citizen or
   □ Asian American  □ Permanent Resident

D. Current Employment Status:
   □ Employed full-time  □ Not employed, pursuing
   □ Employed part-time  □ Not employed, seeking
   □ Not employed, seeking  □ employment

E. If you graduated from the EBI engineering program:
   □ Within the last 12 months  □ Within the last 37 to 48
   □ Within the last 13 to 24 months  □ Over 48 months ago
   □ Within the last 25 to 36 months  □ Over 48 months ago

F. If employed full-time, what is your current annual salary
   (including bonuses):
   □ Below $35,000  □ $35,000 to $44,999
   □ $45,000 to $54,999  □ $55,000 to $64,999
   □ $65,000 to $74,999

G. What was your primary academic major (emphasis) in the
   engineering program? (Choose only one):
   □ Aerospace  □ Engineering
   □ Agricultural  □ Environmental
   □ Architectural  □ Geo/Mining
   □ Bioengineering  □ Industrial
   □ Ceramic  □ Manufacturing
   □ Chemical  □ Marine/Ocean/Naval
   □ Civil  □ Materials/Metallurgical
   □ Computer  □ Mechanical Eng
   □ Computer Sci/Software  □ Nuclear
   □ Construction  □ Petroleum
   □ Electrical/Electronic  □ Info Tech
   □ Eng Mechanics  □ Other Eng Tech

H. Do you contribute financially to the engineering school?
   □ (either directly or through the university):
   □ No  □ Yes: Annually  □ Yes: Periodically

CURRENT POSITION

i. Type of function (choose only one):
   □ Consulting  □ Operations/Maintenance
   □ Customer Service/Support  □ Product Support
   □ Development  □ Product Design
   □ Education  □ Research
   □ Finance  □ Software Development
   □ Management  □ Systems Support
   □ Manufacturing/Production  □ Testing
   □ Marketing/Sales  □ Other
   □ Network/Systems Support  □ Not Applicable

J. My current position is:
   □ Within my engineering field  □ Outside engineering
   □ Within another engineering field  □ I am not employed

K. Size of organization (number of employees):
   □ 50 or less  □ 1,001 to 2,500  □ 2,501 to 5,000
   □ 51 to 150  □ 5,001 to 10,000  □ 151 to 500
   □ 501 to 1,000  □ Over 10,000

RESPONSE KEY FOR QUESTIONS 1 to 10
not at all  extremely

V. ENGINEERING EDUCATION

To what extent did your engineering degree:

1. Expand your career options
   □ Not at all  □ Somewhat  □ Moderately  □ Extremely

2. Provide access to alumni
   □ Not at all  □ Somewhat  □ Moderately  □ Extremely

3. Provide access to employers
   □ Not at all  □ Somewhat  □ Moderately  □ Extremely

4. Assist you in selecting a career
   □ Not at all  □ Somewhat  □ Moderately  □ Extremely

5. Assist you in obtaining a job
   □ Not at all  □ Somewhat  □ Moderately  □ Extremely

6. Increase your earning potential
   □ Not at all  □ Somewhat  □ Moderately  □ Extremely

7. Enhance your upward mobility
   □ Not at all  □ Somewhat  □ Moderately  □ Extremely

8. Provide knowledge necessary to succeed
   □ Not at all  □ Somewhat  □ Moderately  □ Extremely

9. Provide interpersonal skills necessary to succeed
   □ Not at all  □ Somewhat  □ Moderately  □ Extremely

10. Provide technical skills necessary to succeed
    □ Not at all  □ Somewhat  □ Moderately  □ Extremely

OVERALL SATISFACTION WITH CAREER CHOICE

What is your satisfaction with your:

11. Decision to be an engineer
    □ Very dissatisfied  □ Slightly dissatisfied  □ Neutral
    □ Slightly satisfied  □ Very satisfied

12. Choice of engineering discipline
    □ Very dissatisfied  □ Slightly dissatisfied  □ Neutral
    □ Slightly satisfied  □ Very satisfied

13. Choice of employer/graduate school
    □ Very dissatisfied  □ Slightly dissatisfied  □ Neutral
    □ Slightly satisfied  □ Very satisfied

THE BOTTOM LINE: Overall Satisfaction with your engineering education

14. Overall, how well did your undergraduate engineering degree program prepare you for success in your current position?
    □ Very poor  □ Poor  □ Fair  □ Well  □ Very well  □ Excellent

15. To what extent did your engineering educational experience fulfill your expectations?
    □ Far below expectations  □ Below expectations  □ Slightly below expectations
    □ Slightly above expectations  □ Above expectations  □ Far above expectations

16. When you compare the cost (time, expense, effort and lost income) to the contribution (salary, mobility) the degree made to your success, how do you rate its overall value?
    □ Very poor  □ Poor  □ Fair  □ Well  □ Very well  □ Excellent

17. How inclined are you to recommend your Engineering program to a close friend?
    □ Not at all  □ Moderately  □ Extremely

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Figure 2 CE EBI Alumni Assessment, page 1 of 2

12
<table>
<thead>
<tr>
<th></th>
<th>RESPONSE KEY FOR QUESTIONS 18 to 51</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all</td>
</tr>
<tr>
<td>18.</td>
<td>Ability to design experiments</td>
</tr>
<tr>
<td>20.</td>
<td>Ability to conduct experiments</td>
</tr>
<tr>
<td>22.</td>
<td>Ability to analyze and interpret data</td>
</tr>
<tr>
<td>24.</td>
<td>Ability to design a system, component, or process to meet desired needs</td>
</tr>
<tr>
<td>25.</td>
<td>Ability to function on multidisciplinary teams</td>
</tr>
<tr>
<td>28.</td>
<td>Ability to identify or formulate engineering problems</td>
</tr>
<tr>
<td>30.</td>
<td>Ability to solve engineering problems</td>
</tr>
<tr>
<td>32.</td>
<td>Ability to understand ethical responsibilities</td>
</tr>
<tr>
<td>34.</td>
<td>Ability to understand the impact of engineering solutions in a global/societal context</td>
</tr>
<tr>
<td>36.</td>
<td>Ability to use modern engineering tools</td>
</tr>
<tr>
<td>38.</td>
<td>Ability to communicate using oral progress reports</td>
</tr>
<tr>
<td>40.</td>
<td>Ability to communicate using written progress reports</td>
</tr>
<tr>
<td>42.</td>
<td>Ability to pilot test a component prior to implementation</td>
</tr>
<tr>
<td>44.</td>
<td>Ability to use reference materials to support project design</td>
</tr>
<tr>
<td>46.</td>
<td>Ability to recognize the need to engage in lifelong learning</td>
</tr>
<tr>
<td>48.</td>
<td>Ability to apply knowledge of science</td>
</tr>
<tr>
<td>50.</td>
<td>Ability to apply knowledge of mathematics</td>
</tr>
</tbody>
</table>

If your school asked additional questions, record your responses below. If not, leave blank.

SCHOOL SPECIFIC QUESTION RESPONSES

86890

Please return your completed survey in the enclosed envelope.

Thank you for your feedback!
Table 4 Summary of the 2007 CE Advisory Board Survey Results

<table>
<thead>
<tr>
<th>CE Advisory Board Survey Questions</th>
<th>(% of Respondents)</th>
<th>(1 = \text{Low})</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7 = \text{High})</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>UTC CE graduates ...</td>
<td></td>
<td>(0.0)</td>
<td>(0.0)</td>
<td>(0.0)</td>
<td>(0.0)</td>
<td>(100.0)</td>
<td>(0.0)</td>
<td>(6.0)</td>
<td></td>
</tr>
<tr>
<td>1. demonstrate the ability to design a system, component, or process to meet desired needs</td>
<td></td>
<td>(0.0)</td>
<td>(0.0)</td>
<td>(0.0)</td>
<td>(0.0)</td>
<td>(100.0)</td>
<td>(0.0)</td>
<td>(6.0)</td>
<td></td>
</tr>
<tr>
<td>2. demonstrate effective mastery of technical skills</td>
<td></td>
<td>(0.0)</td>
<td>(0.0)</td>
<td>(0.0)</td>
<td>(0.0)</td>
<td>(66.7)</td>
<td>(33.3)</td>
<td>(6.3)</td>
<td></td>
</tr>
<tr>
<td>3. demonstrate interpersonal skills to succeed</td>
<td></td>
<td>(0.0)</td>
<td>(0.0)</td>
<td>(0.0)</td>
<td>(33.3)</td>
<td>(66.7)</td>
<td>(0.0)</td>
<td>(5.7)</td>
<td></td>
</tr>
<tr>
<td>4. effectively function in multidisciplinary environments</td>
<td></td>
<td>(0.0)</td>
<td>(0.0)</td>
<td>(0.0)</td>
<td>(100.0)</td>
<td>(0.0)</td>
<td>(0.0)</td>
<td>(5.0)</td>
<td></td>
</tr>
<tr>
<td>5. easily adopt to various environments</td>
<td></td>
<td>(0.0)</td>
<td>(0.0)</td>
<td>(0.0)</td>
<td>(66.7)</td>
<td>(33.3)</td>
<td>(0.0)</td>
<td>(5.3)</td>
<td></td>
</tr>
<tr>
<td>6. adapt effectively to changing environments</td>
<td></td>
<td>(0.0)</td>
<td>(0.0)</td>
<td>(0.0)</td>
<td>(100.0)</td>
<td>(0.0)</td>
<td>(0.0)</td>
<td>(5.0)</td>
<td></td>
</tr>
<tr>
<td>7. actively pursue continued education</td>
<td></td>
<td>(0.0)</td>
<td>(0.0)</td>
<td>(0.0)</td>
<td>(0.0)</td>
<td>(100.0)</td>
<td>(0.0)</td>
<td>(6.0)</td>
<td></td>
</tr>
</tbody>
</table>
| 8. pursue graduate work                                                                                |                   |\(\text{N/A}\)  |\(\text{N/A}\) |\(\text{N/A}\) |\(\text{N/A}\) |\(\text{N/A}\) |\(\text{N/A}\) |\(\text{N/A}\) |\(6.0\)
| 9. have passed the FE exam and are progressing toward PE registration                                 |                   |\(0.0\)          |\(0.0\) |\(0.0\) |\(0.0\)  |\(66.7\)  |\(33.3\) |\(6.3\)         |       |
| 10. demonstrate effective written communication skills                                                |                   |\(0.0\)          |\(0.0\) |\(0.0\) |\(33.3\) |\(66.7\)  |\(0.0\)  |\(5.7\)         |       |
| 11. demonstrate effective oral communication skills                                                   |                   |\(0.0\)          |\(0.0\) |\(0.0\) |\(66.7\)  |\(33.3\)  |\(0.0\)  |\(5.3\)         |       |
| 12. enhance the effectiveness of your organization                                                  |                   |\(0.0\)          |\(0.0\) |\(0.0\) |\(66.7\)  |\(0.0\)   |\(33.3\) |\(5.7\)         |       |
| 13. demonstrate ability to use reference materials to support project design                          |                   |\(0.0\)          |\(0.0\) |\(0.0\) |\(0.0\)  |\(100.0\) |\(0.0\)  |\(6.0\)         |       |
| 14. demonstrate ability to understand ethical responsibility                                          |                   |\(0.0\)          |\(0.0\) |\(0.0\) |\(0.0\)  |\(100.0\) |\(0.0\)  |\(6.0\)         |       |
| 15. demonstrate ability to understand the impact of engineering solutions in a global/societal context |                   |\(0.0\)          |\(0.0\) |\(0.0\) |\(66.7\)  |\(33.3\)  |\(0.0\)  |\(5.3\)         |       |
| 16. meet a high level of overall satisfaction                                                        |                   |\(0.0\)          |\(0.0\) |\(0.0\) |\(0.0\)  |\(100.0\) |\(0.0\)  |\(6.0\)         |       |
Table 5 Summary of Civil Engineering EBI Educational Objectives Assessment Results

<table>
<thead>
<tr>
<th>Objective</th>
<th>UTC CE Mean Score**</th>
<th>All* Participating schools</th>
<th>Comparison* (UTC CE/All)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE Program will produce graduates who:</td>
<td>Goal: 5.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Have the ability to function as civil engineers.</td>
<td>5.6</td>
<td>5.3</td>
<td>106%</td>
</tr>
<tr>
<td>2. Who agree that UTC was conducive to their achieving</td>
<td>5.7</td>
<td>5.4</td>
<td>106%</td>
</tr>
<tr>
<td>3. Work effectively in multidisciplinary teams</td>
<td>5.8</td>
<td>5.7</td>
<td>102%</td>
</tr>
<tr>
<td>4. Are progressing toward professional registration</td>
<td>6.2</td>
<td>5.7</td>
<td>109%</td>
</tr>
<tr>
<td>5. Participate in professional societies</td>
<td>6.2</td>
<td>5.7</td>
<td>109%</td>
</tr>
<tr>
<td>6. Pursue graduate studies.</td>
<td>6.2</td>
<td>5.7</td>
<td>109%</td>
</tr>
</tbody>
</table>

On June 14, 2007 the CE advisory Board and the CE faculty met to discuss the results of the 2- and 4-year assessment cycles. The Board fully endorsed the CE faculty proposals. The board was notified of the revised results via the telephone.

In the spirit of continuous improvement of the CE program mission and educational objectives, input from the constituents will be sought periodically, analyzed by the CE faculty, with results submitted to the CE Advisory Board for their consideration followed by appropriate curriculum revisions if needed every four years in a six year cycle. Upon the affirmative vote of the CE program faculty, changes to program mission and educational objectives will be proposed, discussed and voted on by the College faculty.

Program Curriculum and Processes to Ensure Achievement of the Program Objectives

Achievement of Educational Objectives is measured in terms of the assessment and evaluation processes in place in the College and in the CE program. Educational Objectives are directly linked to measurable Program Outcomes. Achievement of the higher-level objectives is gauged (1) externally via feedback from constituent groups just discussed and (2) internally by the degree that specific targets are satisfied. Assurances that the Educational Objectives are achieved are provided through a process of continuous curriculum improvement aimed at attainment of the Program Outcomes. The process of continuous curriculum improvement is described in Figure 4, a variation of the EC2000 double loop diagram.
Figure 4 The Two Loop Process for Continuous Improvement of the CE Program.

The outer loop, enhancing educational objectives (Criterion 2), will follow a four year cycle while the lower loop, refining program outcomes (Criterion 3), will follow a two year cycle. While the process provides at least two iterations of refinement and assessment of program outcomes prior to revisiting educational objectives, it remains flexible and permits considerations as deemed necessary by the CE faculty, the constituencies, the college or the university.

To ensure its faithful and ongoing execution, process tasks are assigned to the CE Faculty as a whole under the leadership of the CE ABET coordinator, or where appropriate, to individual faculty who are in turn held responsible and accountable through the University’s Faculty Evaluation and Development by Objectives (EDO) process, annual review of faculty progress, establishment of goals and attainment of objectives. Because of their deliberative nature, the CE faculty as a whole is responsible for the process tasks associated with Defining and Refining Objectives, Determining Outcomes, Setting Criteria and Designing Curriculum Pathways. The faculty as a whole is also responsible for all assessment tasks in the round robin of course folder evaluations. Because of their “data collection” nature, tasks have been assigned to individual faculty for collection of constituent input, evaluation and assessment. Assessment results developed by individual faculty members are presented, reviewed, and approved at CE faculty meetings.
Spring 2008 Status for Evaluation, Feedback, and Program Improvements
The double loop process noted above is being followed with the two year cycle part related to program outcomes being completed in spring 2009. The same two year cycle process will be completed again in fall 2010 with the full four year cycle process being completed in 2011. Completing this process will provide information required to demonstrate that the CE program has completed the assessment, feedback and program improvement processes required to sustain CE program improvements.

The CE faculty will be meeting at regularly scheduled times during academic year 2008 to use feedback materials noted earlier in refining the curriculum and instructional delivery methods required to make CE program improvements.

D. ACCREDITATION: Accreditation for the full six year period was granted for the CE program in fall 2008 by Accreditation Board for Engineering and Technology (ABET) on initial request.
### UTC RELATED UNDERGRADUATE PROGRAMS

<table>
<thead>
<tr>
<th>All Programs in College of Engineering &amp; Computer Science</th>
<th>Number of Graduates</th>
<th>Student Credit Hours</th>
<th>Fall Majors</th>
<th>Accredited by</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSE Degree - Industrial Engineering/Environmental</td>
<td>05-06  4</td>
<td>1136</td>
<td>34</td>
<td>ABET</td>
</tr>
<tr>
<td>BSE Degree - Chemical Specialization</td>
<td>07-08  7</td>
<td>1394</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>BSChE Degree - Chemical Engineering</td>
<td>05-06  3</td>
<td>261</td>
<td>21</td>
<td>ABET</td>
</tr>
<tr>
<td>BSE Degree - Electrical Engineering (Approved in 2006)</td>
<td>06-07  12</td>
<td>1081</td>
<td>77</td>
<td>ABET</td>
</tr>
<tr>
<td>BS Degree - Mechanical Engineering (Approved in 2006)</td>
<td>07-08  3</td>
<td>1009</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>BS Degree - Computer Science</td>
<td>05-06  10</td>
<td>1312</td>
<td>74</td>
<td>ABET</td>
</tr>
<tr>
<td>BS Degree - Computer Science</td>
<td>06-07  13</td>
<td>1294</td>
<td>137</td>
<td></td>
</tr>
<tr>
<td>BS Degree - Computer Science</td>
<td>07-08  26</td>
<td>1607</td>
<td>174</td>
<td></td>
</tr>
<tr>
<td>BS Degree - Computer Science</td>
<td>05-06  21</td>
<td>1751</td>
<td>137</td>
<td>ABET</td>
</tr>
<tr>
<td>BS Degree - Computer Science</td>
<td>06-07  12</td>
<td>1682</td>
<td>175</td>
<td></td>
</tr>
<tr>
<td>BS Degree - Computer Science</td>
<td>07-08  15</td>
<td>2257</td>
<td>186</td>
<td></td>
</tr>
<tr>
<td>MS in Engineering</td>
<td>05-06  1</td>
<td>238</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>MS in Engineering Computational Engineering</td>
<td>06-07  0</td>
<td>268</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>MS in Engineering Management</td>
<td>07-08  2</td>
<td>202</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>MS in Engineering Computational Engineering</td>
<td>05-06  0</td>
<td>45</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>MS in Engineering Computational Engineering</td>
<td>06-07  0</td>
<td>69</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>MS in Engineering Management</td>
<td>07-08  2</td>
<td>71</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>MS in Engineering Management</td>
<td>05-06  2</td>
<td>362</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>MS in Engineering Management</td>
<td>06-07  9</td>
<td>469</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>MS in Engineering Management</td>
<td>07-08  19</td>
<td>681</td>
<td>57</td>
<td></td>
</tr>
<tr>
<td>MS in Computer Science</td>
<td>05-06  4</td>
<td>244</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>MS in Computer Science</td>
<td>06-07  5</td>
<td>201</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>MS in Computer Science</td>
<td>07-08  4</td>
<td>192</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Ph.D. in Computational Engineering (Approved in 2004)</td>
<td>05-06  1</td>
<td>149</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Ph.D. in Computational Engineering (Approved in 2004)</td>
<td>06-07  1</td>
<td>143</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Ph.D. in Computational Engineering (Approved in 2004)</td>
<td>07-08  2</td>
<td>188</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>
V. DEMAND/NEED FOR THE PROGRAM:

Modern society depends upon a stream of engineers to continue expansion of the global economy that is driven, to a large extent, by engineering and technology. Civil engineers now make up approximately 25 percent of all engineers. Demand is expected to remain strong, well into the 21st Century. The civil engineering "concentration” at UT Chattanooga has produced approximately 220 graduates, many of whom remain in the Chattanooga area working for companies like the Tennessee Department of Transportation (TDOT) and Tennessee Valley Authority.

An indication of the demand for Civil Engineers at the national level can be seen in the following data from 2007 edition of “Profiles of Engineering and Engineering Technology Colleges” published by the American Society of Engineering Education.

<table>
<thead>
<tr>
<th>Bachelor's Degrees</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace</td>
<td>1,711</td>
<td>2,011</td>
<td>2,232</td>
<td>2,371</td>
<td>2,722</td>
<td>2,788</td>
</tr>
<tr>
<td>Architectural</td>
<td>513</td>
<td>627</td>
<td>590</td>
<td>722</td>
<td>631</td>
<td>625</td>
</tr>
<tr>
<td>Biological/Agricultural</td>
<td>556</td>
<td>603</td>
<td>601</td>
<td>635</td>
<td>646</td>
<td>659</td>
</tr>
<tr>
<td>Biomedical</td>
<td>1,315</td>
<td>1,628</td>
<td>2,019</td>
<td>2,410</td>
<td>2,917</td>
<td>2,969</td>
</tr>
<tr>
<td>Chemical</td>
<td>5,529</td>
<td>5,233</td>
<td>4,801</td>
<td>4,521</td>
<td>4,452</td>
<td>4,551</td>
</tr>
<tr>
<td>Civil</td>
<td>8,066</td>
<td>8,192</td>
<td>8,142</td>
<td>8,247</td>
<td>8,935</td>
<td>9,402</td>
</tr>
<tr>
<td>Civil/Environmental</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>212</td>
<td>291</td>
</tr>
<tr>
<td>Computer</td>
<td>4,720</td>
<td>5,746</td>
<td>5,838</td>
<td>5,455</td>
<td>4,901</td>
<td>4,046</td>
</tr>
<tr>
<td>Comp. Sci. (inside Eng.)</td>
<td>6,842</td>
<td>8,649</td>
<td>9,156</td>
<td>8,419</td>
<td>7,330</td>
<td>6,446</td>
</tr>
<tr>
<td>Electrical</td>
<td>11,402</td>
<td>11,994</td>
<td>12,500</td>
<td>12,459</td>
<td>11,915</td>
<td>11,467</td>
</tr>
<tr>
<td>Electrical/Computer</td>
<td>2,597</td>
<td>2,782</td>
<td>2,700</td>
<td>2,924</td>
<td>2,825</td>
<td>2,425</td>
</tr>
<tr>
<td>Engineering (General)</td>
<td>1,069</td>
<td>1,105</td>
<td>1,138</td>
<td>1,179</td>
<td>1,176</td>
<td>1,246</td>
</tr>
<tr>
<td>Engineering Management</td>
<td>227</td>
<td>296</td>
<td>302</td>
<td>303</td>
<td>238</td>
<td>274</td>
</tr>
<tr>
<td>Environmental</td>
<td>465</td>
<td>516</td>
<td>576</td>
<td>522</td>
<td>437</td>
<td>454</td>
</tr>
<tr>
<td>Industrial/Manufacturing</td>
<td>3,575</td>
<td>3,789</td>
<td>3,790</td>
<td>3,647</td>
<td>3,664</td>
<td>3,503</td>
</tr>
<tr>
<td>Mechanical</td>
<td>13,247</td>
<td>13,801</td>
<td>14,182</td>
<td>14,947</td>
<td>16,063</td>
<td>16,701</td>
</tr>
<tr>
<td>Metallurgical &amp; Materials</td>
<td>838</td>
<td>859</td>
<td>817</td>
<td>840</td>
<td>909</td>
<td>963</td>
</tr>
<tr>
<td>Mining</td>
<td>112</td>
<td>96</td>
<td>85</td>
<td>92</td>
<td>120</td>
<td>119</td>
</tr>
<tr>
<td>Nuclear</td>
<td>145</td>
<td>135</td>
<td>202</td>
<td>275</td>
<td>342</td>
<td>402</td>
</tr>
<tr>
<td>Other Engineering Disciplines</td>
<td>3,106</td>
<td>2,422</td>
<td>2,488</td>
<td>2,724</td>
<td>2,902</td>
<td>2,942</td>
</tr>
<tr>
<td>Petroleum</td>
<td>257</td>
<td>250</td>
<td>233</td>
<td>315</td>
<td>339</td>
<td>428</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>66,781</strong></td>
<td><strong>71,165</strong></td>
<td><strong>72,893</strong></td>
<td><strong>73,602</strong></td>
<td><strong>74,186</strong></td>
<td><strong>73,315</strong></td>
</tr>
</tbody>
</table>

It can be seen in the above table that approximately 12 percent of all degrees, awarded over the past six years have been to Civil Engineers and that degrees awarded to Civil Engineers has steadily increased over the past six years from 8,066 in 2002 to 9,402 in
2007. Note that Engineering (General) degrees represent less than 1.5 percent of all engineering degrees awarded for this period. Both trends are expected to continue.

Locally, the demand for Civil Engineering has been high, with approximately 25% of all UT Chattanooga engineering graduates for the past six years earning their BSE degrees with a Concentration in Civil Engineering. This indicates strong interest in the discipline by enrolled students. Local hiring of BSE graduates with the Civil Engineering Concentration has been strong. For example, many of our students have been hired by Tennessee Department of Transportation (TDOT) and by the Tennessee Valley Authority which has its corporate engineering headquarters in Chattanooga. A recent report from TVA indicates that more than 20 percent of their engineers are graduates of UT Chattanooga, more than those from any other single institution.

Over the years, the Advisory Board for the College has been engaged in discussions of the efficacy of moving to discipline specific degree program. A historical perspective of their involvement is captured in Figures 4-6 which is letter from Dr. Ronald B. Cox, who served as Dean of the College from 1979 through 1998, to Dr. Phil Kazemersky who served as Interim Dean until 2004.
Dr. Phil Kazemersky  
Acting Dean  
College of Engineering and Computer Science  
University of Tennessee at Chattanooga

RE: Brief Historical Perspective of Engineering Advisory Board  
and Central Issues

Dear Dr. Kazemersky:

I am pleased to provide a brief historical perspective of the Engineering Advisory Board and issues raised during the period from 1970 through 1996. Shortly after the creation of the College of Engineering (then called the School of Engineering) in 1969, the most pressing issue was to recruit highly qualified faculty to develop the curriculum and to provide instruction. In the year or two before an “official” advisory board was formed, there were industrial advisors from TVA, DuPont and Combustion Engineering. These senior managers were keenly interested in there being a “high quality” engineering school in place.

Around 1971, a formal Advisory Board was created which had senior executive representatives from the major companies (and prospective major employers) as members. Such companies and agencies included: TVA, Combustion Engineering, DuPont, Astec, Bell Systems, Campbell Engineering, and other representative consulting engineering firms. Early in the deliberations of the board (and for several years) the primary issues had to do with expanding the curriculum to meet reasonable industrial demands for engineering graduates. Associated with such interests were the requirements for more laboratory facilities and equipment, laboratory support personnel, and general enhancement of the budget to support a growing program.

From the onset of the creation of the engineering program, the structure was one of having a basic (“non-traditional”) engineering program which offered options or concentrations in areas such as mechanical engineering and electrical engineering. The degree itself was a B.S. degree in Engineering. This was done for two reasons. First, it was organizationally more efficient (i.e. there was no requirement to have separate management and separate facilities for each program) and, secondly, it provided some differentiation from other programs in the state (primarily that of the UT Knoxville program).

By 1974, the Advisory Board had begun to question the adequacy of the existing facilities (Grote Hall) and the lack of graduate degrees being offered at Chattanooga. New and expanded facilities were being proposed and justified during the mid 70’s at the

Figure 4. Correspondence from Dr. Cox to Dr. Kazemersky, page 1 of 3.
urging of the Advisory Board. Also, graduate (M.S.) degrees were developed and approved. The Cooperative Engineering Program (begun in 1970) was expanded.

As the first graduates of UTC’s engineering program began to seek employment (1973-1974), they were well received. Employers expressed a high degree of satisfaction with their overall capability to function well in the engineering environment. Most graduates, however, were employed in the Chattanooga region where the college, its faculty, and the program were well known. As graduates began to seek employment outside the region, numerous questions began to be asked by prospective employers regarding the B.S. Engineering degree and how it differed from the traditional engineering degree (i.e. B.S. Mechanical Engineering). It became clear to the Advisory Board members, the faculty, and others, that not having the traditional degree at UTC was a barrier to our graduates being considered for employment at many organizations (especially those not having direct knowledge of the program).

During the 80’s, concentrations were available in mechanical, electrical, civil, industrial, chemical, nuclear, and environmental engineering. An engineering management program was also created. The School absorbed the Computer Science Department. Later, to express more accurately the comprehensive nature of the program offerings, the School became known as the College of Engineering and Computer Science. As a result, The Advisory Board became more interested in, and recommended, the creation of discipline-based degrees and the formation of separate departments.

Although the existence of an interdisciplinary core program with a concentration in a discipline had its merits, it was viewed by many (including the Advisory Board) as being different but not desired. The college successfully developed perhaps the best integrated, interdisciplinary design program (in an undergraduate engineering program) in the country. Its professional development emphasis was recognized nationally by the American Society of Mechanical Engineers in the mid 1980’s (only the second time in the 40 year history of the award it had gone to a university). Still, the program structure (non-disciplinary accreditation) caused a lack of understanding and uncertainty to exist in the minds of many prospective employers. Additionally, a similar uncertainty and lack of understanding existed in the minds of prospective students and their parents. Never has the goal of “different but better” been convincing to most of our constituents (although in many ways it is true). The Advisory Board struggled with this dilemma for years.

Seemingly, marketing attempts to point out the advantages and differences of the UT Chattanooga program only served to heighten the awareness of students and prospective students that UTC’s program was different, but there was little, if any, success in convincing the market that the program was better. The Advisory Board members and other industrial consultants recommended that UTC would be better served in the marketplace (both on the recruiting side and the placement side) if its engineering programs were in the “mainstream.” So, if a company were to be recruiting an electrical engineering graduate, a UTC graduate would automatically be competitive if he or she had an electrical engineering degree (or if he at least graduated from an ABET accredited electrical engineering program). Thus, the graduate would not have to explain (if he got to that stage) how his “engineering” program qualified him as an “electrical” engineer.
For more than a century engineering programs have been characterized by disciplines. As universities around the nation began to offer various programs, they were offered and positioned by discipline (ME, EE, etc.). Consequently, national accreditation was sought and granted by discipline. This “disciplinary” distinction has been pervasive. Today, only a handful of engineering programs (of which UTC’s is one) are accredited under the umbrella of “non-tradition” programs offering the designation of “engineering” as opposed to “mechanical engineering,” “electric engineering,” etc.

The Advisory Board members were keenly aware of the fact that more than 99 percent of the engineering degrees awarded were disciplinary in nature. They also were aware of the fact that when companies determined their projected manpower needs, such needs were expressed by discipline (for example: 5 ME’s, 3 EE’s, etc.). Consequently, recruiters set out year-to-year to find and hire the needed number of ME’s or EE’s. This, said the Advisory Board, worked against the UTC graduate.

Recognizing that UTC was in a competitive environment both for the recruiting of students and the placement of students, the Advisory Board members, faculty, alumni representatives, and friends have favored accreditation by discipline. This was the case throughout the 80’s and 90’s. Associated with this position was the recommendation of the establishment of departments (to reflect the existence of the disciplines).

In the late 90’s, under a new chancellor, the university system accepted the college’s recommendation for change and efforts were begun to move toward disciplinary program accreditation and departmentalization. Such action is currently underway.

The Advisory Board members have always sought to bring the view of the broader engineering community to the attention of the university faculty and administration. They have also been supporters of the programs (speaking favorably of the programs and helping graduates). Finally, they have been aware of, and have recommended, the need for improved institutional support in the areas of funding, staffing, and facilities.

Sincerely,

Ronald B. Cox Ph.D., MBA, P.E.
Burkett Miller Chair of Excellence

Figure 6. Correspondence from Dr. Cox to Dr. Kazemersky, page 3 of 3
VI. **ESTIMATED SIZE OF PROGRAM**

A. **ESTIMATES**

Estimates of headcount and full-time equated enrollment and number of graduates are given in Table 8.

<table>
<thead>
<tr>
<th>Program Year</th>
<th>Full-Time Major Headcount Fall</th>
<th>Part-Time Major Headcount Fall</th>
<th>Total FTE Enrollment Fall</th>
<th>Total Graduates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1 2007</td>
<td>93</td>
<td>18</td>
<td>109</td>
<td>8</td>
</tr>
<tr>
<td>Year 2 2008</td>
<td>102</td>
<td>11</td>
<td>113</td>
<td>10</td>
</tr>
<tr>
<td>Year 3 2009</td>
<td>107</td>
<td>20</td>
<td>127</td>
<td>12</td>
</tr>
<tr>
<td>Year 4 2010</td>
<td>112</td>
<td>25</td>
<td>137</td>
<td>12</td>
</tr>
<tr>
<td>Year 5 2011</td>
<td>122</td>
<td>30</td>
<td>152</td>
<td>14</td>
</tr>
</tbody>
</table>

Provide yearly estimates as follows: Associate Degrees = 3 years; Bachelor's Degrees = 5 years; Master's Degrees = 3 years; Doctoral Degrees = 4 years.

B. **ASSUMPTIONS**

The above projections are conservative. The only firm assumption is that awarding the BSCE degree will eliminate the negative stigma associated with being unable to award a discipline specific degree. Not included is any positive impact from the recent hiring of a full time recruiting coordinator for the College. The projects also do not include any significant increase in enrollment from the newly funded “Project Lead The Way” which is a joint program with the Tennessee Department of Education aimed at encouraging more K-12 students to study engineering. Likewise, the projections do not include a significant increase in enrollment due to the new articulation agreement that has been reached with Chattanooga State Technical Community College to allow a seamless 2 + 2 plan of study for their pre-engineering students. The College intends to seek additional articulation agreements with other Community Colleges. Recruiting of transfer students will likely be enhanced by ten $1,000 scholarships provided by the University of Chattanooga Foundation. These scholarships are matched by corporations and the College gift account, making it possible to offer full tuition scholarships to as many as 10 new transfer students. However, the projections given in Table 8 do not depend upon any of these positive developments. On the up-side, the program has capacity to enroll even more students, perhaps as many as 200, without needing additional space or faculty members.

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C. DEMAND

Civil Engineering represents the third largest segment of engineering, with approximately 12 percent of all engineering enrollment. Most of the 330 colleges of engineering in the US offer BSCE degrees. Demand for civil engineers is expected to remain strong for the foreseeable future, driven partly by the sharp decline since 9/11 in immigration of degree civil engineers from abroad. In addition, there is a growing recognition that the United States needs to increase investment in engineering education in order to respond to the global competition coming from China and India where more than 1,000,000 students are now studying engineering, compared to less than 400,000 in the United States. This is reflected in the “National SMART” program sponsored by Senator Frist that will provide $3.75 billion in funding over the next five years for low-income students who major in "physical, life, or computer sciences, mathematics, technology or engineering. On-line courses and distance learning programs offered by other universities are unlikely to have a significant negative impact on enrollment in the BSCE program at UTC, primarily because of the substantial hands-on laboratory experiences required for learning and accreditation.

C1. COMPARABLE PROGRAMS IN TENNESSEE

Undergraduate engineering enrollments 2007 for universities in Tennessee are given in the following table.

<table>
<thead>
<tr>
<th>Institution</th>
<th>F/T</th>
<th>P/T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tennessee State University</td>
<td>449</td>
<td>108</td>
</tr>
<tr>
<td>Tennessee Technological University</td>
<td>1,252</td>
<td>105</td>
</tr>
<tr>
<td>UT Chattanooga</td>
<td>416</td>
<td>83</td>
</tr>
<tr>
<td>UT Knoxville</td>
<td>1,780</td>
<td>87</td>
</tr>
<tr>
<td>UT Martin</td>
<td>230</td>
<td>15</td>
</tr>
<tr>
<td>University of Memphis</td>
<td>410</td>
<td>93</td>
</tr>
<tr>
<td>Vanderbilt</td>
<td>1,263</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>5,800</td>
<td>491</td>
</tr>
</tbody>
</table>
Most of the engineering students enrolled at UT Chattanooga are Tennessee residents from the counties that make up the Chattanooga metropolitan area, with 57 percent coming from Hamilton County alone. UT Chattanooga enrolls more part time students than any other Tennessee engineering program in Tennessee. UT Chattanooga also enrolls many engineering students who live at home in order to keep down expenses. It would be a financial hardship for these students to attend any of the comparable institutions in Tennessee. The nearest out-of-state engineering program is at George Tech in Atlanta. Tuition for Tennessee residents attending Georgia Tech would be a financial handicap for students as well as a drain on the state’s future pool of engineering talent. UT Martin is the only other university in Tennessee that awards BSE degrees. Allowing UT Chattanooga to award the BSCE degree is unlikely to have a negative impact on any other institution in Tennessee.

VII. FACULTY

A. Currently employed faculty members are listed in Table 10

<table>
<thead>
<tr>
<th>Name of Faculty</th>
<th>Highest Degree Earned</th>
<th>Total Years Teaching Experience</th>
<th>Years Teaching in this Institution</th>
<th>Area of Degree Specialty</th>
<th>Full-Time or Part-Time in Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formunung, Ignatius</td>
<td>Ph.D.</td>
<td>9</td>
<td>3</td>
<td>CE</td>
<td>FT</td>
</tr>
<tr>
<td>Foster, Edwin</td>
<td>Ph.D.</td>
<td>40</td>
<td>40</td>
<td>CE</td>
<td>FT</td>
</tr>
<tr>
<td>Goulet, Ronald</td>
<td>Ph.D.</td>
<td>10</td>
<td>10</td>
<td>CE</td>
<td>PT</td>
</tr>
<tr>
<td>Owino, Joseph</td>
<td>Ph.D.</td>
<td>21</td>
<td>9</td>
<td>CE</td>
<td>FT</td>
</tr>
</tbody>
</table>

Total FTE Current Faculty in Program: 3.5

B. Faculty resumes for the above faculty members are in the appendix.

C. No new faculty members are required.

VIII. ADMINISTRATION/ORGANIZATION

The BSCE program will be administered by the Mechanical, Chemical, Civil, Environmental and Industrial Engineering Department under the administrative structure shown in Figure 7. Dr. Mike Jones will provide supervision. No additional administrative duties will be associated with changing the name of the degree from BSE to BSCE.
Figure 7. Administrative Structure

University of Tennessee, Board of Trustees
Dr. John Peterson, President
University of Tennessee

University of Tennessee at Chattanooga
Dr. Roger Brown, Chancellor

Academic Affairs
Dr. Philip B. Oldham, Provost and Vice Chancellor for Academic Affairs

College of Engineering and Computer Science
Dr. Will Sutton, Professor and Dean

Mechanical, Chemical, Civil, Electrical, Environmental and Industrial Engineering
Dr. Michael Jones, Director

Department of Computer Science and Engineering
Dr. Andy Novobilski, Head

Engineering Management & Graduate Programs
Dr. Neslihan Alp, Director

Chair of Excellence in Computational Engineering
Dr. Harry McDonald

Graduate School of Computational Engineering and the SIM Center
Dr. David Whitfield, Associate Dean and Director

Freshman Engineering & Advising
Dr. Gary McDonald, Director

Chair of Excellence in Management & Technology
Dr. Ronald Cox
IX. LIBRARY RESOURCES

A. The Lupton Library on the UT Chattanooga campus provides adequate support for the engineering program as evidenced by the recent re-accreditation by ABET.

B. No additional library funding will be required to support changing the name of the degree from BSE to BSCE.

X. SUPPORT RESOURCES

In summer 2003 the College of Engineering and Computer Science at UT Chattanooga moved into the new Engineering, Mathematics, and Computer Science (EMCS) building. This 200,000 square foot, state-of-the-art facility provides adequate space and equipment for all existing programs, with room to grow. No additional space or equipment will be required to support changing the name of the degree from BSE to BSCE.

XI. COST/BENEFIT

There are no costs associated with changing the name of the degree from BSE to BSCE. Immediate, tangible benefits will accrue to graduates of the newly named program. Long term benefits will accrue to UT Chattanooga by making it easier to recruit new students by removing the confusion and perhaps stigma associated with being unable to award discipline specific degrees. From a financial standpoint, the increased enrollments likely to occur due to the change will make it possible to leverage the recent investment of more than $28 million in the new EMCS building.

XII. COSTS/PRODUCTIVITY OF RECENTLY-INITIATED PROGRAMS

The Graduate School of Computational Engineering is the only new academic program approved by THEC for the College of Engineering and Computer Science during the past decade. This program is ahead of projections for graduate student enrollment and the related SimCenter is ahead of projections for external funding.
<table>
<thead>
<tr>
<th>Program</th>
<th>Approved/ Implemented</th>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Fall Enrollment</td>
<td>Annual Graduates</td>
</tr>
<tr>
<td>BS Electrical Engineering</td>
<td>7/27/2006/ Fall 06</td>
<td>65</td>
<td>3</td>
</tr>
<tr>
<td>BS Mechanical Engineering</td>
<td>7/27/06/ Fall 06</td>
<td>110</td>
<td>0</td>
</tr>
<tr>
<td>PhD Computational Engineering</td>
<td>1/29/2004/ Fall 04</td>
<td>6</td>
<td>15</td>
</tr>
</tbody>
</table>

XIII. **CONSULTANT** - Not applicable.
CIVIL ENGINEERING FACULTY RESUMES

SUMMARY VITA – Edwin P. Foster, Ph.D., P.E.
Professor

Years on Faculty: 30 (original appointment 09/79)

Degrees:
B.E. Civil Engineering, Vanderbilt University, 1964
M.S. Structural engineering, Vanderbilt University, 1966
Ph.D. Structural engineering, Vanderbilt University 1974

University Experience:
Assistant Professor & Coordinator of Civil Engr. UT-Nashville 1968-74
Associate Professor & Coordinator of Civil Engr. UTN 1974-79
Assoc. Professor hired to develop a Civil Engr. concentration, UTC (1979-1983)
Assoc. Professor & Director of Civil, Industrial, & Engineering Management (1983-1984)
Professor & Director of Civil, Industrial, & Engineering Management (1984-1993)
Professor & Director of Civil Engineering (1993-1996)
Professor & Director of Civil Engr., Recruiting & Alumni Activities UTC (1996-2000)
Professor and Director of Engineering Recruiting & Alumni Affairs (2000-2002)
Professor & Director of Engr. Graduate Program UTC (2002-2006)
Professor of Civil Engineering (2006-Present)

Other Related Experience:
American Bridge (U S Steel) - Field Engr. on Vehicle assembly bldg., Cape Kennedy, 1964
Brown Engineering - Structural Analysis of launch tower, F1 rocket engine, Huntsville 1965
University of Illinois - Research Assistant on finite element analysis, 1966
Vanderbilt University - Teaching Assistant, 1967
Avco Aerostructures Division - Finite element analysis of plates in bending, Nashville 1968
NASA Langley - Computer analysis of space structures, Hampton VA, summer 1977,78

Consulting and Patents (last five years):
McKee Foods Corp., Mr. David Ryder, Colledagelde, TN, Conveyor belt structural calculations
Structural engineering consulting on roof and floor designs, alterations, structural evaluations for
safety, etc.
AR-Knits, American Research & Knitting, Cleveland, TN 2001, UT Center of Industrial Services
Lear Corporation, Dayton, TN, 2003, die dolly structural investigation
Tecumseh Products Company, Dunlap, TN, 2004, Concrete parking lot consulting
States in which Registered: Tennessee (inactive), Georgia (active)

Principal Publications/Presentations of Last Five Years:
“The Proposed CE Program at UTC”, Chattanooga Branch of ASCE, Sept.19, 2000
“Accrediting the New Civil Engineering Program at UTC”, Chattanooga Branch of ASCE, 7/16/02
“Encouraging Professionals to Teach University Level Classes” ASEE Southeast Section Annual
Meeting,
Chattanooga, TN, April 3-5, 2005 (with Steve Meyer)  
"Having Fun with Concrete Structural Design Utilizing TK Solver Software" Southeast Section Annual  
Meeting, Chattanooga, TN, April 3-5, 2005  
"The Impact on Students of Freshman Design Projects Supporting Advanced Courses", ASEE Annual Meeting,  
"TK-Solver Concrete Design", American Design Drafting Technical Training Conference,  
Chattanooga, TN,  
April16-19, 2007

Scientific and Professional Society Memberships:  
ASCE – Tennessee Section President 1996  
ASEE – Chairman, Civil Engineering Division, ASEE Southeast Region, 1982, 1986, 1993

Honors and Awards:  
Outstanding Teaching Award from the Univ. of TN National Alumni Association, 1977  
Univ. of TN/Chattanooga Engineering Professor of the Year, 1984 & 1987  
Chattanooga area "1996 Engineer of the Year", awarded at Engineering Week banquet  
Received NSF Fellowship 1964-65, NASA Summer Fellowship 1978,79  
Member Tau Beta Pi - National Engineering Honor Society  
Nominated by two UTC graduates for "Who’s Who Among America’s Teachers"

Institutional Service in the Last Five Years (committee assignments, etc.):  
Faculty Advisor for ASCE Student Chapter 1981-Present  
Coordinated and taught in Civil PE Review course 1997-2001  
Coordinated the FE Review course 1997-2001  
Director UTC Graduate Engineering Program 2001-2006  
UTC Graduate Council member 2001-Present  
UTC Engineering Curriculum Committee 1998-Present  
Obtained UTC site license for TK-Solver software, value $1000/year, 1999-Pres.  
Chairman Engineering Library acquisitions 1999-Pres

Professional Service in the Last Five Years:  
President American Society of Civil Engineers - Tennessee Section 1996  
President American Society of Civil Engineers - Nashville Section 1979, Vice Pres.,  
Sec-Treas., Board of Directors - Nashville Section, District Nine Council member  
TN Society of Professional Engineers, Chattanooga, Treasurer 1985,86 Secretary 1987  
American Society for Engr. Education, Chair Civil Engr., Southeast Section 1982,86,93,94

Professional Development Activities Last Five Years:  
7-16,17,18-01 - Univ. of Colorado Eighth Faculty Enhancement Workshop, “Fundamentals of
Concrete Technology
4-7,8,9 2002 - Univ. of FL, Gainesville, American Society for Engineering Education + ABET Assessment Workshop.
10-18-02 (also 2003,4,6) - ASCE, Smyrna, TN, ASCE TN Section annual meeting

Aug 2-4, 2004 - The Engineering & Economics of Reinforced Concrete Buildings, Portland Cement Association, Skokie, IL,
Aug 5-6, 2004 - Design of Concrete Bridges by the AASHTO LRFD Specifications, Portland Cement Association, Skokie, IL,
3-18-03, ASCE, Chattanooga, Chattanooga Riverfront Proposed Development
5-20-03, ASCE, Chattanooga, Mark Harrison, PE, PG, EA & Groundwater Remediation System Design
10-18-03, ASCE, Nashville, National ASCE meeting 6-15-04, ASCE, Chattanooga, President of the ASCE Tennessee Section, Ken Berry. Ken discusses the TN State Capital which recently became an ASCE Civil Engineering Landmark.
8-17-04, ASCE, Chattanooga, Chattanooga’s ITS by Steve Meyer of Volkert & Assoc.

9-21-04, ASCE, Chattanooga, Roundabout Applications, John VanWinkle
9-24-04, ASCE, Smyrna,TN, ASCE TN Section annual meeting & conference

10-19-04, ASCE, Chattanooga, High Speed Trains For TN, Brian Whitaker, Arcadis
11-16-04, ASCE, Chattanooga, The Construction Viewpoint on Design Plans, David Young of Volkert
8-17-04, ASCE, Chattanooga, Runway Construction @ Hartsfield-Jackson Airport
4-4to5-05, ASEE, UT-Chattanooga, Annual conference
8-23-05, ASCE, Chattanooga, Runway Construction at Hartsfield-Jackson Airport
9-20-05, ASCE, Chattanooga, Industrial Hygiene Issues in Real Estate/Property
10-18-05, ASCE, Chattanooga, Engineering Studies at UTC by Dean Bailey
11-11-05, UTC, Seminar “Recruiting Graduate Students”
11-15-05, ASCE, Chattanooga, New Standards – Air Pollution Control Board
3-21-06, ASCE, Chattanooga, Contech PVC Pipe for Sanitary Sewers
10-13-06, Smyrna,TN, ASCE TN Section Annual meeting & conference
SUMMARY VITA – Ignatius Fomunung, Ph.D.

Associate Professor

Years on Faculty: 3 (original appointment 08/2005)

Degrees:
B.E. Civil Engineering, Southeast University, Nanjing, China, 1987
M.S. Physics, Clark Atlanta University 1995
M.S. Transportation engineering, Georgia Institute of Technology, 1996
Ph.D. Civil engineering, Georgia Institute of Technology, 2000

University Experience:
Assistant Professor of Physics, Spelman College, (1999-2000)
Assistant Professor of Civil Engr. Clark Atlanta University (2000 – 2005)
Associate Professor of Civil Engr., UTC (2005 – Present)

Other Related Experience:
Center for Theoretical Studies of Physical Systems (CTSPS) at CAU - Research Associate, Atomic and Molecular Physics, Summer 2000.

Consulting and Patents (last five years):

Principal Publications/Presentations of Last Five Years:

Scientific and Professional Society Memberships:
ASCE
ASEE

Honors and Awards:
San Hao Xuecheng, Nanjing Institute of Technology, PRC 1986
Sigma Pi Sigma National Physics Honor Society, 1995
EXCEED Teaching Fellowship, American Society of Civil Engineers Excellence in Civil Engineering Education Fellowship, 2003
Institutional Service in the Last Five Years (committee assignments, etc.):
Faculty Advisor for NSBE Student Chapter 2006-Present
UTC Faculty Senate
Faculty Handbook Committee
UTC Publications Committee

Professional Service in the Last Five Years:
Volunteer Math Tutor – Howard High School in collaboration with the UTC GEAR –UP program
Activate Chattanooga Forum
Safe Routes to School Partner.
Active Living Network
NASA Research Summit, Orlando Florida, July 16-19, 2003 Steering Committee Member
NSF – Proposal Review Panelist, 2006

Professional Development Activities Last Five Years:
Council on Undergraduate Research (CUR) Proposal Writing Institute, Juniata College,
Huntington, PA. Summer 2002
Second Annual Scholarly Technical Assistance Workshop for NASA Faculty Awards for Research Principal Investigators and Their Students, QEM Network, Albuquerque, NM, October 18-19, 2002
National Science Foundation, Introducing Faculty to Materials Science and Engineering,
University of Alabama, Tuscaloosa, June 1-20, 2003
American Society of Civil Engineers’ Excellence in Civil Engineering Education (ExCEED) Teaching Workshop. University of Northern Arizona, August 10-15, 2003
Third Annual Scholarly Technical Assistance Workshop for NASA Faculty Awards for Research Principal Investigators and Their Students, QEM Network, Atlanta, GA, September 26-27, 2003
American Concrete Pavement Association Professor’s Seminar: Design, Construction, and Rehabilitation of Concrete Pavements, at Portland Cement Association, Skokie, IL, May 31 to June 2, 2006
SUMMARY VITA – Joseph O. Owino, Ph.D., P.E.
UC Foundation Associate Professor

Years on Faculty: 9 (original appointment 08/01/99)

Degrees:
B.S. Civil Engineering, The University of the District of Columbia, 1977
M.S. Civil Engineering, Howard University, 1980
Ph.D. Civil and Environmental Engineering, Georgia Institute of Technology, 1998

Other Related Experience:
Adjunct Professor (1999) Civil and Environmental Department, Georgia Institute of Technology, Atlanta, GA.
Lecturer (1986 – 1992) Civil and Environmental Department, University of Nairobi, Nairobi, Kenya.
GTA (1994 – 1998) Civil and Environmental Department, Georgia Institute of Technology, Atlanta, GA.
Shell Oil Company, Houston, TX (1981-1983)
Electrack Inc., Beltsville, MD (1980)
States in which Registered: Tennessee

Consulting and Patents:
None

Principal Publications of Last Five Years:


J. Owino, E. Foster, Revising a Civil Engineering Curriculum at University of Tennessee at Chattanooga, presented at the ASEE 2001 Southeastern Section Meeting, April 2001.


Scientific and Professional Society Memberships:

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American Society of Engineering Educators (ASEE)
American Society of Civil Engineers (ASCE)
National Society of Black Engineers (NSBE)

**Awards and Honors:**
“Exceptional Merit” Faculty Performance Award in 2002-2003
Outstanding Faculty Award for 2002, CECS, UTC, April 2002
Cole Outstanding Engineering Teacher Award of the year in Engineering Award, CECS, UTC, November 2001
Amoco/CETL Teaching Excellence Award, May 1998, Georgia Institute of Technology.

**Institutional Service in the Last Five Years:**
Faculty Senator, elected to Faculty Senate (2001 – present)
Faculty Representative, elected member, Grades Appeal Committee (2002 – present)
Faculty Representative, elected member, Admissions Committee (2001 – present)
Member, NCAA Self-Study Committee (2001 – present)
Member, CECS Graduate Committee (2001 – present)
Member, CECS Assessment Committee (2001 – present)
Member, CECS Petitions Committee (2002 – present)
Member, Search Committee, Associate Provost for Academic Affairs (2002 – present)
Member, Search Committee, Dean of the CECS (2002 – present)

**Professional Service in Last Five Years:**
Chair of Civil Engineering Division, ASEE SE Section

**Professional Development Activities in the Last Five Years:**
Research Activities:
Development of Finite Element Modeling
Experiential Learning in the Mechanics of Materials Lab
Nondestructive evaluation of structural materials
Health Monitoring of Infrastructure

**Conferences and Meetings attended:**
ASEE
NSBE

**Other Activities:**
Attended a series of teaching workshops held by the University and at Carnegie Mellon.
Attended an ANSYS and a GTSTRUDL structural engineering software training classes.
SUMMARY VITA – Ronald U. Goulet, Ph.D., P.E.
Associate Professor

Years on Faculty: 10 (original appointment 08/01/98)

Degrees:
B.S. Civil Engineering, Northwestern University, 1976
Ph.D. Mechanical Engineering, University of New Hampshire, 1997

Other Related Experience:
Consultech, Chattanooga, TN and Maine; 1987 to present.
Dravo-Wellman div. of Dravo Corp., Pittsburgh, PA, 1984-86
Hydro Ash Corp., Pittsburgh, PA, 1980-84
United Conveyor Corp., Deerfield, IL, 1979-80
Polytechnic Inc., Chicago, IL, 1975-79
States in which registered: Maine

Principal Publications of Last Five Years:
P. Stafford, M. Ianotti, R. Goulet, Effects of Plate Location and Selection on the Stability of Mid-Shaft Clavicle Fractures, 19th Annual Mtg, MidAmerican Orthopaedic Assoc, 4/20/01.
M. Ianotti, B. Norris, R. Goulet, Biomechanical Effect of Pelvic Internal or External Fixation on Vertical Shear Pelvic Fracture, 19th Annual Mtg, MidAmerican Orthopaedic Assoc, 4/20/01.
P. Stafford, M. Ianotti, R. Goulet, Effects of Plate Location and Selection on the Stability of Mid-Shaft Clavicle Fractures, presented at the Annual Mtg, of the Tennessee Orthopaedic
Association, 8/24/00.
M. Ianotti, B. Norris, R. Goulet, Biomechanical Effect of Pelvic Internal or External Fixation on Vertical Shear Pelvic Fracture, presented at the Annual Mtg. of the Tennessee Orthopaedic Association, 8/24/00.

Scientific and Professional Society Memberships:
American Society of Mechanical Engineers
American Society for Engineering Education
American Society of Safety Engineers (past associate member)

Honors and Awards:
Member, Sigma Xi Research Society
Faculty Scholarship, Grants and Research, UTC for 2000.
Engineering Research Award, CECS, UTC for 1999.

Institutional Service in the Last Five Years (committee assignments, etc.):
Resident Research Committee, UT Department of Orthopaedic Surgery, active
Steering Committee of Bridges to Engineering Science and Technology, active
UTC Engineering Graduate Curriculum Committee, active
ME ABET Committee, active
UTC Honor Court, active
UTC Faculty Council, 1999-2001
UTC Committee of Committees 1999-2001
UTC Communication Task Force 1998-2000

Professional Service in the Last Five Years:
Secretary Chattanooga Chapter of ASME
Annual PDH speaker for Chattanooga Chapter of ASME
Regular presenter to Chattanooga Engineers Club

Professional Development Activities in the Last Five Years:
Ethics Across the Curriculum, Summer Workshop; Center for the Study of Ethics in the Professions; Illinois Institute of Technology, Chicago, August 2002.