

**DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING  
UNIVERSITY OF TENNESSEE, KNOXVILLE**

**MISSION AND GOALS DOCUMENT**

**PREAMBLE**

The Department of Civil and Environmental Engineering is one of seven departments in the College of Engineering at The University of Tennessee, Knoxville, a land grant state university which is the major research university in the state. This document assumes that goals, objectives, and standards are all subject to periodic review and change. However, the statements herein represent concepts that have general acceptance by the faculty and thus some permanency. While there may be differing opinions relative to the weight placed on individual goals, they generally represent “end states” for which we strive as a department.

The Mission and Goals Document reflects the needs and desires of the department as a composite group of individuals working together in the common interest of meeting the department’s mission. This document reflects both the activities and the resources that the department’s faculty feels are necessary to allow it to achieve its mission. Some of the objectives and standards in this document relate to specific individual accomplishments. While an individual faculty member may not meet all of these objectives and standards, each faculty member is expected to perform his/her duties in a way that is consistent with the concept of a faculty member as “teacher-scholar.” The goals, objectives, standards, and strategies enunciated herein are intended to lead to continuous improvement on the part of individual faculty members and, in turn, of the department as a whole, with the ultimate goal of being recognized as one of the premier programs in the nation.

**MISSION STATEMENT**

Consistent with the mission of the university and college, the mission of the Department of Civil and Environmental Engineering is three-fold: (1) to educate the engineers of tomorrow such that they are prepared to practice in a global economy; (2) to contribute to state and national economic growth through effective and visible research; and (3) to serve the public through the efforts of individual faculty and students.

## **DEPARTMENT GOALS**

- Goal 1. Provide a high quality undergraduate teaching and learning environment in designated areas of civil engineering in order to allow students to enter the general practice of civil engineering and/or pursue graduate education.
- Goal 2. Provide a high quality graduate teaching and learning environment in selected areas of civil and environmental engineering.
- Goal 3. Enhance the Department's national and international standing by conducting significant basic and/or applied research in civil and environmental engineering.
- Goal 4. Contribute to the economic and social development of the state, region, and nation by maintaining mutually beneficial partnerships with the public and private sectors.
- Goal 5. Develop and retain a diverse and high quality faculty and support staff to engage in undergraduate education, graduate education, research, and development of the civil and environmental engineering professions, and seek qualified members of underrepresented groups when filling new positions.
- Goal 6: Be recognized as one of the outstanding programs among our peers regionally and nationally, as well as within the University of Tennessee community, in terms of instruction, research, and creative activity.

The following sections provide details on the objectives, standards and strategies to accomplish these goals. For ease in having an overview of the strategically important standards, the target values are presented in Appendix 1. In addition, strategies that require additional resources which are summarized in Appendix 2. Benchmarking results are reported in Appendix 3.

**Goal 1. Provide a high quality undergraduate teaching and learning environment in designated areas of civil engineering in order to allow students to enter the general practice of civil engineering and/or pursue graduate education.**

Objective 1a. Maintain ABET accreditation.

Standard: Meet or exceed each ABET general criterion and each ASCE program criterion.

Strategy: Assign priority to course offerings, faculty selection, and budget planning, such that accreditation standards will be met

Demonstrate proficiency in the following areas of civil engineering: environmental, geotechnical, structures, transportation, and water resources.

Implement an ongoing assessment program to determine the effectiveness of the undergraduate program with respect to the ABET requirements.

Objective 1b. Maintain an appropriate student/faculty ratio.

Standard: Desirable level at 15/1, maximum at 18/1.

Strategy: Maintain an appropriate minimum GPA for transfer students.

Limit class sizes to 25 in design intensive courses, and 15 in laboratory sections.

Objective 1c. Provide state-of-the-art undergraduate teaching and laboratory equipment and facilities.

Standard: Replace/upgrade on the average 80 percent of the teaching, laboratory and support equipment on a seven-year cycle.

Strategy: Establish an annual budget line item for the initial purchase, replacement and upgrading of computers, laboratory equipment and facilities. (See Appendix 2)

Actively solicit external support for equipment from available sources including the technology assessment fee and the engineering fee.

Objective 1d. Complement teaching and laboratory instruction with graduate student assistants and/or staff personnel.

Standard: Provide lab technician or a 1/4 time (10 hrs/week) GTA per every two laboratory sections for each undergraduate laboratory course.

Provide the equivalent of eight-1/4 time (10 hrs/week) GA's for the computer laboratory (half funded by OIT).

Provide a 1/4 time (10 hrs/week) GTA to assist with grading and office hours for each course with an enrollment over 25.

Strategy: Assign high priority to GTA's in budget planning. (See: Appendix 2)

Objective 1e. Attract highly qualified and motivated students to the department

Standard: Maintain an average ACT score at least two points above the university average for the students entering the department.

Strategy: Seek funding for additional and/or larger scholarships to enhance recruiting and retention.

Increase the visibility of the department through the use of the internet, and other appropriate marketing techniques.

Objective 1f. Produce high quality graduates.

Standard: Maintain a FE passing rate of at least 90 percent.

Meet expectations of the potential employers of our students.

Strategy: Demonstrate the overall quality of the graduates from the program through self-assessment procedures.

Maintain the departmental honor code.

Provide a highly competent faculty, dedicated to undergraduate education.

Recognize effective teaching and advising in the departmental evaluation of faculty members and in subsequent merit awards.

Enhance the environment for communication between students and faculty, and foster strong bonds of faculty-student interaction through seminars, extracurricular activities, and personal advising.

Ensure that students have exposure to the practice of civil engineering by:

- X Facilitating and encouraging practice related experience through work experience.
- X Encouraging participation in the Student Chapter of the American Society of Civil Engineers (ASCE) and other professional societies.
- X Consulting an external advisory board of practitioners to assist with the development of the curriculum
- X Providing a senior design project including meaningful engineering design experiences

Ensure that graduates will compete favorably for employment and graduate school opportunities by:

- X Providing professional courses to achieve proficiency in the five designated areas of civil engineering
- X Fostering an appreciation for professional development and life long learning
- X Providing an undergraduate education that is recognized for its excellence both statewide and nationally
- X Providing professional development opportunities consistent with current engineering practice

**Goal 2. Provide a high quality graduate teaching and learning environment in selected areas of civil and environmental engineering.**

Objective 2a. Offer high quality, contemporary and diverse graduate course work and learning experiences in the areas of construction, environmental, geotechnology/infrastructure materials, public works, structural, transportation and water resources engineering.

Standard: Support each emphasis area with an appropriate number of full time faculty members.

Support a seminar program and/or student organization in each area of concentration.

Strategy: The faculty teaching load will be defined to be consistent with the THEC formula.

Where appropriate, use well qualified adjunct professors to supplement the teaching faculty.

Provide departmental support at \$500 per area for student seminars, field trips or professional student organization functions.

Provide departmental support to co-sponsor appropriate short courses and workshops where applicable.

Objective 2b. Maintain an appropriate number of high quality graduate students.

Standard: Maintain an appropriate number of graduate students to achieve Objective 3a and 3b.

Strategy: Set a minimum GPA and GRE level for admission to the graduate program by area of concentration.

Develop a marketing program to attract well-qualified students of diverse backgrounds from UT as well as outside schools.

Increase the visibility of the department by maintaining a current department web page

Provide additional opportunities for part time students through distance learning classes and web-based instruction.

Objective 2c. Provide state-of-the-art graduate teaching and laboratory equipment and facilities.

Standard: Provide a professional environment for student interaction for each emphasis area.

Minimum: 50 sq. ft. office and common space per person

Desirable: 75 sq. ft. office and common space per person

Strategy: Support renovation of Perkins Hall, Estabrook Hall and Berry Hall.

Objective 2d. Complement the teaching and laboratory instruction with graduate student assistance and/or staff personnel.

Standard: Provide a lab technician or a 1/4 time (10 hrs/week) GTA for each graduate laboratory section.

Provide a 1/4 time (10 hours/week) GTA to assist with grading and office hours for graduate classes with an enrollment over 25.

Strategy: Assign priority to GTA's and/or staff personnel in budget planning.

**Goal 3. Enhance the Department's national and international standing by conducting significant basic and applied research emphasizing infrastructure systems and environmental technologies.**

Objective 3a. Strengthen the Ph.D. program to achieve national recognition in surveys of public research universities.

Standard: Insure the timely completion of doctoral degrees as measured by the number of Ph.D. degrees granted per faculty per year consistent with the target values in Appendix 1.

Strategy: Support a pool of qualified, first year doctoral students through departmental assistantships and fellowships. (See: Appendix 2).

Positions should normally be limited to one year in order to provide rapid rotation. Equity should be considered among faculty members.

Promote graduate teaching assistantships in the undergraduate "Engage" program to provide teaching experience and to provide financial support to doctoral candidates.

Compete aggressively for top caliber Ph.D. students.

Establish competitive doctoral stipends.

Objective 3b. Provide opportunities for graduate student and post-doctoral participation in sponsored research.

Standard: Obtain average annual research funding per faculty as noted in Appendix 1.

Insure the timely completion of PhD and masters degrees as measured by the number of degrees granted per faculty per year to consistent with the target values in Appendix 1.

Receive a base-level of 15% release time per semester per faculty member to establish an investment fund to support research and graduate students.

Strategy: Develop a faculty workload plan that includes recognition of the time commitment required for proposal development/preparation and the supervision of research. Utilize adjunct faculty, post-doctoral fellows and Ph.D. students, consistent with the THEC teaching formula, to assist with the teaching load.

Provide post-doctoral support, including seed funding, for faculty who are developing new, large-scale, research initiatives. (See Appendix 2).

Reduce the use of faculty release time funds for baseline budget support of the department to zero to allow reinvestment.

Encourage faculty to assume leadership and advising roles in research centers/consortiums and pursue joint appointments where appropriate. Encourage faculty and student participation in the functioning of UT research centers and regional/state research consortiums.

Objective 3c. Secure and maintain adequate equipment resources to support the Department's research goal.

Standard: Purchase state-of-the-art research equipment and replace/upgrade support equipment.

Strategy: Establish an annual budget line item for research and support equipment. (See Appendix 2)

Objective 3d. Provide up-to-date research facilities and infrastructure to meet current needs and ensure facilities are sufficient to accommodate future growth.

Standard: Assure that at least 7,000 sq. ft. of dedicated research space per 1 million in annual dollars of sponsored research is available.

Strategy: Place a high priority on upgrading and/or securing additional research space.

Take advantage of research facilities available at centers both on and off campus.

Objective 3e. Promote faculty scholarship that enhances the national/international standing of the department through archival publication and information transfer activities.

Standard: Publish an average refereed journal articles (as recognized by the Web of Science) consistent with the target values in Appendix 1.

Attain a level of cited published works (as identified by the Web of Science) as listed in Appendix 1.

Recognize the enhanced visibility associated with textbook, software and design/practice manual authorship.

Recognize the visibility associated with publication in peer-reviewed conference proceedings.

Strategy: Publish scholarly works in top tier, peer-reviewed (refereed) journals that are widely disseminated to practitioners and researchers.

Develop a faculty workload plan that includes recognition of the time commitment required for the preparation and completion of peer-reviewed works. Utilize adjunct faculty, post-doctoral fellows and Ph.D. students, consistent with the THEC teaching formula, to assist with the teaching load.

Provide the funds necessary to satisfy any page charges (and other costs) required for publication.

Provide the necessary staff support to assist with graphics, word-processing, paper preparation, etc.

Provide funding to satisfy costs associated with preparation and dissemination of materials.

Objective 3f. Promote active involvement by the faculty in professional organizations and symposia that advance the civil and environmental engineering professions.

Standard: Faculty should present research findings (or accompany their student advisee during the presentation) at one abstract-reviewed or full paper-reviewed conference per year.

Faculty should be significantly involved in and contribute to the conduct of at least one state/national/international professional organization.

Faculty should participate in peer-review activities involving professional groups and funding agencies/sponsors, by volunteering to serve as reviewers.

Strategy: Provide funding for travel to one conference per year per faculty member for a platform presentation. (See Appendix: 2).

Provide travel funding to one professional meeting per year to each faculty member holding a leadership position in that organization. (See Appendix 2).

Develop a faculty workload plan that includes recognition of the time commitment required for peer-review activities.

**Goal 4. Contribute to the economic and social development of the state, region, and nation by maintaining mutually beneficial partnerships with the public and private sectors.**

Objective 4a. Encourage public service assistance activities.

Standard: A maximum of 10 percent of an individual faculty member's work load can be assigned to professional or public assistance activities per semester.

Strategy: Faculty should be encouraged to respond to public assistance activities when appropriate.

Objective 4b. Encourage student exposure to the practice of civil engineering through professional practice experience.

Standard: Approximately 70% of the undergraduate student body should participate in professional practice experience.

Strategy:

Encourage students to gain practical experience.

Objective 4c. Encourage faculty entrepreneurship and professional practice.

Standard: Faculty participation in consulting and entrepreneurial relationships contributes to the educational process and department mission.

Strategy: Support the patent and intellectual property policies of the University.

Encourage private sector spin-off of entrepreneurship relationships.

Authorize faculty participation in consulting and entrepreneurial efforts as provided in University policies.

**Goal 5. Develop and retain a diverse and high quality faculty and support staff to engage in undergraduate education, graduate education, research, and development of the civil and environmental engineering professions, and seek qualified members of underrepresented groups when filling new positions.**

Objective 5a. Further the professional development of the faculty and staff.

Standard: Attend one conference, workshop, short course or seminar per full time faculty and staff per year.

Provide two one-semester professional development experiences per year.

Strategy: Work toward establishing a state funded staff and operating budget for the department which is at least the percentage of faculty salaries recommended by the THEC formula (currently 27 percent).

Allocate the workload to support a departmental professional development program.

Use merit pay to reward faculty for quality in teaching, research productivity, and scholarly activity achievements.

Maintain a professional development fund for each faculty member, which shares salary recovery and research incentive funds between the Department and the individual. Faculty are encouraged to pool funds.

Provide a mentorship program for untenured faculty.

Objective 5b. Encourage diversity among the faculty, staff and student body.

Standard: Increase the representation of women and minorities in the civil and environmental engineering professions.

Strategy: Adhere to the University of Tennessee affirmative action policies.

Encourage an awareness of available resources to enable additional women and minorities to enter the civil and environmental engineering professions.

Support national and state programs to attract and retain women and minorities into the engineering profession.

Objective 5c. Encourage faculty to pursue excellence in teaching.

Standard: Increase and financially support participation in activities specifically devoted to assisting faculty in improving the quality and effectiveness of their classroom and non-classroom teaching activities.

Strategy: Recognize and support professional development initiatives and innovations to enhance the effective delivery of classroom, laboratory and non-classroom teaching.

Publicize the availability of and encourage faculty participation in seminars and workshops to improve the effectiveness of teaching.

Evaluate faculty teaching effectiveness through a periodic departmental peer review process by examining the currency of material presented to students, methods of student evaluations, catalog descriptions, course contents, textbooks and the quality of student assignments.

**Goal 6: Be recognized as one of the outstanding programs among our peers regionally and nationally, as well as within the University of Tennessee community, in terms of instruction, research, and creative activity.**

Objective 6a. Maintain substantial activity in appropriate Thematic Areas of Strength recognized by the university's research leadership.

Standard: Provide effective instructional programs, research endeavors, and scholarly activities to support the University's recognized Thematic Areas of Strength, in particular the following areas that directly relate to the Department's combined expertise and interests:

X Computational and Information Sciences

X Biotechnology

X Materials Science

Strategy: Same Strategies as required to support the objectives of Goals 1 to 3.

Standard: Provide effective instructional programs, research endeavors, and scholarly activities to support the University's recognized Research Centers and Institutes.

Strategy: Encourage and reward faculty leadership and participation in Center and Institute research projects and program planning activities.

Encourage and support graduate student involvement in Center and Institute research projects.

Objective 6b. Be identified and recognized as one of the outstanding programs at UT during the Academic Program Evaluations (APE) review.

Standard: Establish a record of excellence with respect to the APE criteria:  
X Clearly demonstrate national ranking and/or recognition.  
X Strive to improve standing among peer institutions.  
X Be composed of faculty members who work together with commitment to a common vision.  
X Evidence high levels of faculty productivity.

Strategy: Meet the criteria stipulated in the Department of Civil and Environmental Engineering Workload/Achievement Assessment document relative to departmental accomplishments.

Continuously document the Department's activities in order to track the implementation of activities.

Continuously improve instructional content such that the Department scores above the College average on the CTEP teaching evaluation.

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## **Appendix 1**

### **Target Values**

<b>Objective</b>	<b>2010</b>
1b. UG Students/Faculty	15
1d. ¼ GTA for lab courses w/o tech.	4
¼ GTA for courses >25	24
¼ GA for computer lab (1/2 funded by OIT)	8
1e. ACT scores above university average	+2
1f. FE exam passing rate	90%
2c. ¼ GTA for lab courses w/o tech	2
¼ GTA for courses >25	2
3a. Ph.D. Degrees/Faculty/Year	0.33
3b. Research Expenditures/Faculty/Year	\$300,000
Salary Recovery	15%
3b. MS Degrees/Faculty/Year	1.5
3d. Research Space, SF	50,000
3e. Refereed Articles/Faculty/Year	3.0
3e. Cited Works/Faculty/Year	15.0
3f. Conference participation/year	3
4b. Professional practice experience	70%

## Appendix: 2

### Resources Required to Implement Strategies

Many of the goals and strategies in this Mission and Goals Document cannot be satisfied without increases in resources and changes in resource allocation within the department.

Objective Supported	Implementation method	Resources required 2005	Funds required 2005	Proposed source of resources
1c: undergraduate teaching equipment	annual budget line item at 5% of the gross departmental budget	5% of gross dept. budget	\$100K	Equip, Engr, Tech. Fees
1d: GTA support	¼ time GTA's	25	\$125K	Salary recovery
3a: doctoral fellowships	Pool of support for first year doctoral students	20	\$192K	Salary recovery, College
3b: post-doctoral fellowships	Pool of support for first year of post-doctoral applicants	4	\$160K	College
3c: research and support equipment	annual budget line item at 5% of the gross departmental budget	5% of gross budget	\$100K	Equip., Engr., Tech., Fees
3f: active involvement in professional organizations/symposia	travel funds for faculty	2 per faculty	\$60K	Engr. Fee
<b>TOTALS</b>			\$737K	

### Appendix 3 2005 Benchmarking

	University of Tennessee	Average of Peers	Arizona	Florida	Maryland	Iowa State	Virginia	NC State	
<b>Benchmarking Parameters</b>									
US News Graduate School Rank	48	29.5	38	28	22	28	38	23	
Percentile Rank (%)	21	13	17	13	10	13	17	10	
US News Undergraduate Rank									
Average Quantitative GRE Scores	722					753			
Average Analytical GRE Scores	629					630			
Percent Students with Scholarships	20					27			
Percent Co-op Students	11					4			
Percent Minority Undergrad. Students	5.5					8			
Publications/Faculty	2.1	(3.2)				3.6			
Web of Science Citations	8.9	(13.4)							
Full-time faculty	19	28	13	41	30	31	15	38	
Full-time female faculty	1	2.7	0	1	5	4	3	3	
Undergraduate Enrollment	245	413.5	249	526	199	738	130	639	
Number of B.S. Graduates	68	79.0	43	88	34	151	44	114	
Number of female B.S. Graduates	9	16.0	8	10	6	26	20	26	
Number of minority B.S. Grads.	4	5.7	4	13	4	2	8	3	
Full-time Ph.D. Students	19	50.2	34	74	68	36	30	59	
Total M.S. Students	144	82.2	18	112	96	95	37	135	
Full-time M.S. Students	38	62.7	18	112	54	95	32	65	
Total M.S. Graduates	40	35.0	8	63	29	28	15	67	
Total Female M.S. Graduates	6	5.2	2	6	2	4	5	12	
Total Minority M.S. Graduates	3	4.7	0	11	6	0	0	11	
Total Ph.D. Graduates	6	6.7	2	7	9	2	2	18	
Total Female Ph.D. Graduates	0	1.0	0	1	2	0	0	3	
Total Minority Ph.D. Graduates	0	0.2	0	0	0	0	0	1	
Total Research Expenditures (\$M)	5.48	7.89	1.27	16.57	10.04	8.1	3.77	7.59	
Federal Research Expenditures (\$M)	3.05	3.01	1.23	6.75	4.57	1.88	1.58	2.07	
<b>CALCULATED PARAMETERS</b>									
FT PhD Students/FT Faculty	1.00	1.79	2.62	1.80	2.27	1.16	2.00	1.55	
PhD Graduates/Faculty	0.32	0.24	0.15	0.17	0.30	0.06	0.13	0.47	
FT MS Students/FT Faculty	2.00	2.24	1.38	2.73	1.80	3.06	2.13	1.71	
Total MS Students/Faculty	7.58	2.93	1.38	2.73	3.20	3.06	2.47	3.55	
MS Graduates/Faculty	2.11	1.25	0.62	1.54	0.97	0.90	1.00	1.76	
BS Students/Faculty	12.9	14.8	19.2	12.8	6.6	23.8	8.7	16.8	
BS Graduates/Faculty	3.6	2.8	3.3	2.1	1.1	4.9	2.9	3.0	
Research Exp./FTE Fac. (\$K)	288	282	98	404	335	261	251	200	
Fed. Res. Exp./Total Res. Exp. (\$K)	161	108	95	165	152	61	105	54	
UG In-State Tuition	4312	4540	3604	2780	6759	4342	5925	3829	
UG Out-State Tuition	12380	15726	12374	13808	17433	13684	21945	15113	
Grad In-State Tuition	4872	5411	3604	4926	7041	5038	7817	4038	
Grad Out-State Tuition	13380	15397	12374	18589	11595	14214	19925	15687	

