Department of Civil & Environmental Engineering
The University of Tennessee
December 3, 2014

Strategic Plan

Introduction:
The Department of Civil & Environmental Engineering Strategic Plan reflects the needs and desires of the department as a composite group of individuals working together in the common interest of achieving the department’s vision. The Plan calls for significant refocusing on and growth in the BS/MS program, considerable expansion of undergraduate research, increasing the quality and quantity of doctoral students and integrating and enhancing targeted research areas. These are themes that support the College of Engineering and the University of Tennessee (VOL Vision) Strategic Plans. This document assumes that items addressed are all subject to periodic review and change; however, the statements herein represent concepts that have been approved by the faculty and thus some permanency. The goals, objectives, strategies and actions enunciated in the Plan are intended to lead to continuous improvement of the department through an active and engaged faculty, staff, student body, and advisory board. Although individual faculty member contributions to the Plan will vary, the totality of all activities will allow for the needs of the department, as a whole, to be met. It is recognized that additional resources will be required to implement this Plan and that the extent of success achieved by the department will be contingent upon those additional resources being made available to develop the items identified.

Vision Statement:
Our vision is to develop a uniquely integrated undergraduate-graduate education and research program in Civil and Environmental Engineering thereby positioning us to be an educational institution of choice for both students and employers, and a national leader in post-baccalaureate education and research.

Mission Statement:
Our mission is to integrate research and education in Civil and Environmental Engineering through 1) teaching that emphasizes both fundamentals and their application in engineering design; 2) research that provides both the innovations of today and trains the innovators of tomorrow; 3) a permeating culture of professionalism, ethics, innovation, and life-long learning; and 4) service that supports, promotes, and nurtures the professional and educational communities in which we are engaged.
Goals:

**GOAL #1: DEVELOP AN INTEGRATED UNDERGRADUATE/GRADUATE EDUCATIONAL PROGRAM**

1.1 **OBJECTIVE: ENHANCE THE QUALITY OF GRADUATES AND THEIR GRADUATION RATES IN BS AND BS/MS PROGRAMS**

1.1a **Strategy:** Develop a recruitment program attracting qualified undergraduates

1.1a.1 **Action:** Reach out to transfer students at selected community colleges to leverage Tennessee Promise Program.

1.1a.2 **Action:** Improve recruiting at in the Engineering Fundamentals first year program, with an emphasis on attracting Honors students.

1.1a.3 **Action:** Increase outreach to local high schools through direct interaction or a summer enrichment program.

1.1a.4 **Action:** Maintain high activity during Engineer’s Day.

1.1b **Strategy:** Outline the credit requirements and course flow chart for BS and BS/MS degree programs

1.1b.1 **Action:** Develop a 4 year BS curriculum of 126 hours that provides a broad-based foundational education in accordance with all departmental objectives and outcomes.

1.1b.2 **Action:** Develop a 5 year BS/MS curriculum of 150 hours for qualified undergraduate students that provides advanced specialized training in at least one Civil/Environmental Engineering concentration.

1.1b.3 **Action:** Establish other yearly milestone factors (such as UTrack) for success in BS and BS/MS programs.

1.1c **Strategy:** Seek funding for 5th year in BS/MS program

1.1c.1 **Action:** Engage 5th year BS/MS students in funded research.

1.1c.2 **Action:** Refocus existing undergraduate scholarships within department to support 5th year BS/MS students.

1.1c.3 **Action:** Procure new scholarship/fellowship money through collaboration with:

1.1b.4a Alumni
1.1b.1d Practitioners
1.1b.4c Consulting firms
1.1b.4d Industry
1.1b.4e Government

1.1c.4 Action: Develop summer internships through collaboration with the CoE Office of Professional Practice and the Professional Development Office

1.1d Strategy: Promote faculty involvement in student activities

1.1d.1 Action: Enhance participation in student chapter organizations

1.1d.1a ASCE, ITE, IWRA, VWB, WEF/AWWA/IWA, AWMA, AREMA, and others

1.1d.2 Action: Expand out-of-classroom interactions

1.1d.2a Provide students an engaging area to meet and interact
1.1d.2b Incorporate field trip(s) in courses
1.1d.2c Develop faculty Facebook pages
1.1d.2d Encourage after class student help sessions
1.1d.2e Participate in on- and off-campus service activities
1.1d.2f Develop faculty led international research and education experiences

1.1d.3 Action: Enhance focus on ASCE chapter activities and participation

1.1d.3a Encourage chapter involvement in research
1.1d.3b Extend volunteer service activities
1.1d.3c Focus on leadership development
1.1d.3d Modify student advising to include ASCE component
1.1d.3e Create a highly visible area to promote activities
1.1d.3f Provide yearly funding by department to support chapter activities

1.2 Objective: Develop Integrated Program Requirements

1.2a Strategy: Coordinate course content within BS and BS/MS programs

1.2b Strategy: Establish core competences for each practitioner area

1.2c Strategy: Coordinate MS comprehensive exams

1.2c.1 Action: Develop MS comprehensive exams for multiple practitioner areas (Environmental, Water Resource, Structural, Transportation and Geotechnical Engineering)
1.2d **Strategy:** Develop and/or partner with another program to provide training in computational methods to support graduate education and research

1.2d.1 **Action:** Compile web page that identifies current elective course offerings to strengthen background in computational methods.

1.2d.2 **Action:** Investigate curricular options to increase computational competence.

1.2e **Strategy:** Develop other program activities including a departmental seminar series for both undergraduate and graduate students

1.2e.1 **Action:** Provide funding to support dynamic outside practitioners and researchers

1.3 **OBJECTIVE: CHANGE STUDENT/FACULTY/ADMINISTRATION/EMPLOYER CULTURE**

1.3a **Strategy:** Establish the added value of BS/MS as a distinguished degree program

1.3a.1 **Action:** Develop new advising protocol

1.3a.2 **Action:** Develop marketing strategy

1.3a.3 **Action:** Provide BS/MS program training to freshman advising office

1.3b **Strategy:** Establish employer participation program in BS and BS/MS programs

1.3b.1 **Action:** Develop focus group that includes constituent employers

1.3b.2 **Action:** Include practitioner’s in classroom teaching

1.5 **PERFORMANCE MEASURES OF SUCCESS FOR GOAL #1**

1) Increase undergraduate enrollment at least at the same pace as the College of Engineering

2) Exceed a pass rate of 90% for the Fundamentals of Engineering exam

3) Support the university 6-year graduation rate increase for undergraduate students from 60% to 75%.

4) Increase student participation in the 5 year BS/MS program to 50% of qualified students by 2015

5) Increase the annual fraction of MS/BS degrees to BS-only degree graduates to 0.3 by 2015

6) Double summer school enrollment by 2015 from a 2011 baseline.
**GOAL #2: EXPAND UNDERGRADUATE RESEARCH EXPERIENCE**

2.1 **OBJECTIVE: INCREASE UNDERGRADUATE INVOLVEMENT IN RESEARCH ACTIVITIES**

2.1a **Strategy:** Develop undergraduate coursework track for research to extend critical thinking, expand writing ability, participate in discovery of new knowledge and develop a greater appreciation for lifelong learning

2.1a.1 **Action:** Establish a 3 credit hour in-class undergraduate research perspectives course

   2.1a.1a Incorporate course into program of study as a technical elective
   2.1a.1b Provide exposure to research
   2.1a.1c Focus on problem solving that is applications based
   2.1a.1d Provide/obtain data for assessment and analysis
   2.1a.1e Encourage ownership of class material
   2.1a.1f Establish a dedicated bulletin board announcing the topics for each session

2.1a.2 **Action:** Revise one hour undergraduate laboratory course (general or discipline specific) to include research exercise(s)

   2.1a.2a Devote two lab reports per semester to demonstrate scientific writing

2.1a.3 **Action:** Utilize CE 407/409 for a 3 hour special project research experience

   2.1a.3a Conduct hands-on discipline specific laboratory research
   2.1a.3b Develop an independent undergraduate thesis
   2.1a.3c Encourage participation in EURēCA Exhibition

2.1a.4 **Action:** Develop a CEE departmental writing guide that will be applied in 205, 305, 310, discipline-specific labs, and other departmental courses

2.1b **Strategy:** Enhance undergraduate participation in funded research projects

2.1b.1 **Action:** Provide faculty and graduate student mentors to each research track undergraduate student
2.1b.2 Action: Integrate undergraduate students into regularly scheduled group research meetings

2.1b.3 Action: Increase undergraduate funding for research

2.1b.3a Identify potential PIs to develop and submit proposal for REU site and/or other undergraduate research program(s)

2.1b.3b Improve ties with undergraduate research program at UT

2.1b.3c Collaborate with the office of research at UT

2.1b.3d Provide departmental funding for Freshman Honors students to supplement research funding

2.1b.4 Action: Expand the number of undergraduate students on research grant funding

2.1b.4a Incorporate undergraduate funding in research proposals

2.1b.4b Provide international research experience

2.2 Objective: Change student culture regarding research

2.2a Strategy: Develop protocol for undergraduate advising concerning research

2.2b Strategy: Provide uniform graduate school information to undergraduates

2.2b.1 Action: Obtain training for faculty

2.2c Strategy: Encourage student organization research participation

2.2c.1 Action: Refocus some aspects of ASCE student chapter toward student and faculty research activities

2.2f Strategy: Develop a research component for the Engineering Fundamentals student fair

2.3 Performance Measures of Success for Goal #2

1) Expand participation in research related courses each year to include 30% of BS graduates by 2015

2) Increase paid undergraduate participation in faculty research activities each year to on average two per faculty member of BS students by 2015
**Goal #3: Promote Post-Baccalaureate Education (Research-PhD)**

3.1 **Objective:** Build leading research program in one or more targeted area(s)

3.1a **Strategy:** Enhance integration of research activities

3.1a.1 **Action:** Convene an annual research workshop to identify collaborative interdisciplinary short- and long-term target areas that would benefit the department.

3.1a.2 **Action:** Promote organized research efforts through departmental and university-level resources.

3.1a.3 **Action:** Promote/catalyze visible research in organized research areas within UTK and with other institutions

3.1a.4 **Action:** Consider new faculty hires in one or more of these organized areas while balancing curricular requirements

3.1a.5 **Action:** Increase research personnel, professors and associates

3.1a.6 **Action:** Increase chaired professorships

3.2 **Objective:** Enhance incoming student quality

3.2a **Strategy:** Develop national/international graduate recruitment plan

3.2a.1 **Action:** Initiate a common mechanism to financially support first year doctoral students

3.2a.2 **Action:** Encourage College of Engineering to identify key aspects of recruitment and build a marketing plan including a College-wide recruiting open house

3.2a.3 **Action:** Develop and maintain a high caliber web site

3.2a.4 **Action:** Set minimum requirements for admission

3.2a.5 **Action:** Develop recruiting support from peer institutions and feeder schools

3.2b **Strategy:** Promote a diverse student body

3.2b.1 **Action:** Encourage a mix of domestic/international and race and gender diverse students through graduate teaching and research assistantships

3.3 **Objective:** Expand the doctoral program

3.3a **Strategy:** Redirect most GTA/GA positions to doctoral level students

3.3b **Strategy:** Pursue long-term funding of PhD students

3.3b.1 **Action:** Include additional PhD positions in proposals
3.3b.2 Action: Investigate private foundations and federal programs for scholarship and fellowship support

3.3b.3 Action: Pursue NSF NRT awards

3.3c Strategy: Provide competitive stipends
3.3c.1 Action: Include higher salaries for PhD students in proposals
3.3c.2 Action: Pursue Bredesen Center, Chancellor’s, and ESPN fellowship support

3.3d Strategy: Increase number of doctoral students that obtain faculty positions after graduation
3.3d.1 Action: Develop and advertise a training program for PhD students
   3.3d.1a Author peer-reviewed papers
   3.3d.1b Participate/write at least one proposal
   3.3d.1c Participate as lecturer in classroom teaching
   3.3d.1d Give multiple conference presentations
   3.3d.1e Serve on a professional committee
   3.3d.1f Serve as a peer reviewer for a journal
   3.3d.1g Encourage students to take academic career preparation course

3.3e Strategy: Identify employment opportunities for PhD graduates
3.3e.1 Action: Track past PhD graduate career paths
3.3e.2 Action: Provide mentoring to secure employment

3.4 Objective: Develop seamless research integration with ORNL
3.4a Strategy: Actively collaborate with ORNL/UT joint faculty members on research, proposals, manuscripts and student committees

3.4b Strategy: Participate in ORNL/UT Energy/Engineering research program

3.5 Objective: Cultivate an outstanding faculty
3.5a Strategy: Establish a positive environment for faculty retention
   3.5a.1 Action: Complement the summative annual review process with formative feedback from the mentors and department head.

3.5b Strategy: Provide sufficient time and other resources to promote faculty success
3.5c Strategy: Ensure faculty have the necessary latitude to contribute to the collective, departmental level goals outlined in this plan

3.5d Strategy: Strive for continuous improvement through an active and engaged faculty that contribute to meet all the needs of the department

3.5e Strategy: Value gender and ethnic diversity among faculty

3.5f Strategy: Increase teaching faculty

**Performance Measures of Success for Goal #3**

1) Increase number of enrolled doctoral students by 25% by 2015 from a 2011 baseline.

2) Increase graduation of full-time, 5-year doctoral students to 80% of doctoral graduates by 2015

3) Increase the number of post PhD faculty positions of graduates to 10% by 2015

4) Expand tenure track faculty size to 24 by 2015

5) Achieve above average faculty and staff salaries (per rank) compared to aspiring peer institutions by 2015