STRATEGIC PLAN
COLLEGE OF ENGINEERING
UNIVERSITY OF TENNESSEE, Knoxville

PREFACE

The University of Tennessee at Knoxville is the State of Tennessee’s flagship research institution, a campus of choice for outstanding undergraduates, and a premier graduate institution. As a land-grant university, it is committed to excellence in learning, scholarship and engagement with society. The College of Engineering is an instrumental resource of The University to achieve its educational, economic development, and globalization goals, with the ultimate purpose of advancing the frontiers of human knowledge and enriching and elevating society. The College’s strategic plan is also aligned with the University’s VOL Vision—The Pursuit of Top 25 Strategic Plan and the Journey to the Top 25 Action Plan.

Historical Overview

In 1834, Joseph Estabrook, a man of strong scientific interest and background, became the president of what was then East Tennessee College. Estabrook hired a group of distinguished professors to provide instruction in chemistry, geology, mineralogy, trigonometry and civil engineering. The first engineering courses were taught in 1838. In 1877, the university was organized into three colleges: Agriculture and the Organic Arts; Mechanic Arts, Mining and Engineering; and Languages and Fine Arts. The State of Tennessee legislature officially named the institution The University of Tennessee in 1879, and authorized the granting of advanced degrees in both civil and mining engineering. Since that time, the college has expanded its degree programs to include 12 Bachelor of Science, 17 Master of Science, and 14 PhD programs and participation in one multidisciplinary PhD program in Energy Science and Engineering. The degree programs are housed in seven departments within the college, one in the College of Agriculture and Natural Sciences, and additional faculty at the University of Tennessee Space Institute in Tullahoma TN. The college is also home to six major research centers (Center for Materials Processing, Center for Transportation Research, the Innovative Computing Laboratory, the Reliability and Maintainability Center, the Scintillation Materials Research Center, and the NSF funded Center for Ultra-Wide-Area Resilient Electric Energy Transmission Network (CURENT)). It also participates in other

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1 Approved on 02-07-2006 by the ad-hoc 2004-2005 COE Strategic Plan Committee consisting of Adedeji Badiru, Wayne Davis, Alberto Garcia (Chair), William Hamel, Walter Odom, and Masood Parang. Vision and Mission statements updated in 2007 and 2010. Revised draft developed December 2011 for guidance in developing departmental plans and finalized in August 2012—Wayne Davis
University-based centers including four UT/ORNL Joint Institutes and provides direction and leadership of many of these.

The Cooperative Engineering Program, now renamed as the Office of Engineering Professional Practice, was established in the College of Engineering in 1926. The Office offers students an opportunity to combine both academic study and professional work experience. The college established the Minority Engineering Scholarship Program (MESP) in 1973 in order to increase the number of African-American students enrolled in engineering studies. The program, now referred to as the Office of Diversity Programs continues to provide financial and scholastic support to students each year. The program is also a long-term participant in the NSF funded Tennessee Louis Stokes Alliance for Minority Participation (TLSAMP)—designed to increase the enrollment and graduation rate of ethnic minorities), and the National Graduate Degrees for Minorities (GEM) Consortium (focused on providing fellowships and internships for highly qualified under-represented students wishing to pursue graduate degrees). The program also has a summer Bridge Program aimed at enhancing the success of entering undergraduate students and three on-campus summer outreach programs to encourage students in the 7th-12th grades to consider engineering. These are the Middle School Introduction to Engineering Systems (MITES), Introduction of Sophomores to Engineering Principles (INSTEP), and High School Introduction to Engineering Systems (HITES).

Engage, a unique freshman engineering program designed to provide hands-on learning in addition to academic engineering courses, was established in 1999. In addition, the college has a very strong engineering honors program which begins at the freshman year and continues through the senior year, including a National Academy of Engineering (NAE) Grand Challenges Scholar program for students who have met requirements in the areas of interdisciplinary education, entrepreneurship, international activities, research experience and service learning.

**Purpose and Organization**

The purpose of this strategic plan is to provide guidance to the college and its departments and offices. The strategies formulated in this plan are consistent with the vision and mission statements of the College and the university and support the achievement of the goals of both. The plan has broad objectives that guide the College's progress and serve as a document which can be revisited and updated as needed.

This document is organized into seven sections. Section 1 defines the scope of strategies included in the plan. Section 2 summarizes the vision statement of the College. Section 3 documents the mission statement of the college. Section 4 lists relevant core values of the College and University which define the culture of the Volunteer Spirit, allowing the formulation, design, implementation and control of the strategic plan delineated in this document. Section 5 documents the goals of the strategic plan. Section 6 identifies and recommends specific objectives to achieve the goals. Section 7 contains the strategies that need to be implemented to achieve the objectives.
1. INTRODUCTION

The overall conceptual approach to strategic planning is outlined as follows. The values or norms that are shared by all members of the College along with the available resources define the environment within which the plan has been developed. The plan consists of overall goals that are reached through the accomplishment of specific objectives which in turn are achieved as a result of performing a cohesive body of functional strategies (courses of action). Strategies are formulated in the following areas:

1. Teaching (undergraduate and graduate programs)
2. Research/Scholarship
3. Outreach
4. Professional and public service
5. Recruiting, retention and professional development
6. Diversity
7. Visibility
8. Facilities
9. Development

The process to design and maintain the strategic plan is iterative in nature due to the interaction existing between the environment and the functional strategies. It is also iterative in that it is also modified on a periodic basis based on strategic plans provided by the departments and other units within the college as well as from outside of the college such as the VOL Vision strategic plan and the college’s Board of Advisors.

2. VISION STATEMENT

The College of Engineering is resolved to become one of the country’s top 25 public engineering colleges. To bring this vision to reality, the college is committed to these five charges:

1. Attaining national and international recognition among peer institutions for excellence in both research and teaching.
2. Assembling a dynamic body of faculty who exemplify excellence and innovation in the pursuit and delivery of knowledge and will perpetuate the highest standards of engineering education for future generations.
3. Graduating students who are well educated in technical knowledge, who have solid communication and teamwork skills, and who can compete successfully in the global business world and contribute significantly to the national base of engineering education and technology.
4. Investing strategically in the college’s most important resources—students, faculty and programs—through the vigorous acquisition of private gifts from individuals, corporations and foundations.
5. Partnering with academic, industrial and government entities that share and enhance the mission of the College of Engineering, so that our educational and collaborative efforts result in the maximum, positive, economic impact locally, regionally, nationally and globally.

3. MISSION STATEMENT

The mission of the College of Engineering is:

1. To provide high quality education in the major engineering disciplines from the undergraduate through doctoral levels through a creative balance of academic, professional and extracurricular programs;
2. To foster and maintain mutually beneficial partnerships with our alumni, friends, industry and local, state and federal governments through public services assistance and collaborative research; and
3. To be a major contributor to our nation’s technology base through scholarship and research to grow beyond their disciplines by participation in ethics and leadership programs.

4. VALUES—The Volunteer Spirit

In support of the college’s mission and vision and the university’s VOL Vision, and while our strategic plan, like that of the university will evolve over time, the following values have been established and comprise our definition of the Volunteer Spirit. In addition they permeate who we are, what we do, and how we accomplish our goals. In our college and university, we value:

1. Broad diversity, including people of all races, creeds, ethnicity, gender, sexual orientations, gender identities, physical abilities, and socioeconomic groups;
2. A culture that appreciates and respects faculty, staff, and students and that acknowledges their interdependence and the vital role of every member of the Volunteer family;
3. Engagement with our local and extended communities, embracing intercultural and global perspectives;
4. High standards of ethical and professional behavior;
5. Intellectual curiosity, pursuit of knowledge, free exchange of ideas, and academic freedom and integrity;
6. Transparent and data-informed decision making;
7. Wise management of resources and infrastructure; and
8. Our campus, our people, and our work.

5. GOALS

The College of Engineering is committed to the attainment of the following goals:
Goal 1. Achieve national and international recognition for the quality, productivity, and visibility of educational and research programs.

Goal 2. Attract and retain excellent undergraduate and graduate students.

Goal 3. Attract, retain, and foster continued development of excellent faculty.

Goal 4. Focus on activities that will be recognized by a consistently improved ranking in external assessments.

Goal 5. Foster demographic and intellectual diversity within a common purpose.


6. OBJECTIVES

The previous goals are intended to be achieved through the accomplishment of the following objectives. Each objective represents a more particular aim contained within one or more goals:

1. Enhance the quality of all undergraduate engineering programs, incorporating distinctive undergraduate experiences, including undergraduate research, public service opportunities, and international experiences, and ensure that all undergraduates gain the knowledge, perspectives, and skills necessary to succeed in today’s complex, global environment.

2. Offer graduate engineering programs that compete nationally and internationally for the most highly qualified students.

3. Enhance support for areas of engineering research and scholarship, including multi-disciplinary research, that demonstrate excellence and significant potential for addressing critical state, national, and international issues and needs.

4. Expand service involvement to enhance the quality and effectiveness of the College.

5. Promote the building of new facilities and the improvement of existing ones within the common purpose of providing excellent resources to enhance teaching, research and service programs.

7. STRATEGIES

7.1 Undergraduate Programs

1. Strengthen recruiting and retention activities.

2. Improve the engineering curricula to enable our graduates to flourish in their professional careers. Specific improvements will be focused on technical content and a broad range of intellectual and experiential activities that promote an understanding of cultural, social, and political systems in an international environment.

3. Develop new teaching laboratories and strengthen existing teaching laboratories.

4. Strengthen our ties with industry both inside and outside the classroom.

5. Promote, support, and track the participation of undergraduate students in research programs.
6. Promote, support and track participation of undergraduate students in international experiences.

7.2 Graduate Programs

1. Continue periodic and comprehensive evaluation and improvement of the graduate programs, including identification of new emerging areas in which graduate programs are needed.
2. Actively recruit top students nationally to enter our Masters and Ph.D. program.
3. Expand distance education programs within available resources.

7.3 Research

1. Continue to actively recruit outstanding individuals to join our faculty, including the Governor’s Chair program.
2. Develop and enhance faculty strength in new and emerging areas in engineering.
3. Promote increased sponsored research activity by faculty members.
4. Promote the further development of interdisciplinary research activity through joint proposals and faculty appointments.
5. Continue to expand the research relationship with federal agencies, Oak Ridge National Lab (ORNL), Y-12 and other national laboratories.
6. Enhance the interaction between the College and University Research Centers/Institutes and the College’s faculty and students.
7. Increase the collaboration with industrial partners in research.

7.4 Outreach

1. Provide a wide variety of activities to K-12 students, with participation of teachers and parents, to endow them with adequate understanding of what engineering is and its varied disciplines and career options. This includes Engineers Day, sponsorship of FIRST Robotics, TN Science Olympiad, TN Junior Science and Humanities Symposium, Pre-Collegiate Scholars Program, Governor’s School in Engineering, and other outreach programs.
2. Promote the understanding and appreciation of engineering among community college students.
3. Expose the public to learning experiences designed to emphasize the importance to society of science, technology, engineering and mathematics (STEM).
4. Provide state-of-the-art distance education and continuing education programs.

7.5 Professional and Public Service

1. Encourage faculty participation in funded-research review panels in government and corporate organizations.
2. Promote participation in leadership roles in professional discipline specific engineering societies, as well as engineering education societies.
3. Encourage faculty participation in editorial roles and peer review activities for prestigious engineering journals.

### 7.6 Recruitment, Retention and Professional Development

1. Offer nationally competitive salaries for new faculty hires at all faculty ranks based on analysis of salaries of public colleges of engineering that are ranked 25th or better.
2. Resolve salary equity issues for current faculty to be commensurate with salaries of public colleges of engineering that are ranked 25th or better.
3. Attract faculty and reward faculty excellence by providing named chaired positions and professorships and by annual faculty awards for excellence in research and teaching.
4. Provide opportunities for faculty to seek new directions and enhance existing teaching and research activities.
5. Actively solicit funds from our industrial partners and other external sources to support faculty professional developmental activities.
6. Attract and retain a proficient, dedicated, and energized staff.
7. Assure effective communication between faculty and staff on significant issues (e.g., academic programs, scholarships, computer resources, college’s policies, etc…) so that both faculty and staff can function effectively as College representatives to students and the outside community.

### 7.7 Diversity

1. Recruit and retain as faculty, staff, and students, members of underrepresented groups including African Americans, Hispanic Americans, Native Americans, and females.
2. Enhance existing recruiting programs such as MITES, INSTEP, and HITES existing scholarship programs, and create new ones designed to make engineering a more attractive discipline among underrepresented students.
3. Emphasize curricular development activities recognizing the importance of cultural diversity.
4. Increase the level of internationalization of the College by enhancing study abroad programs, exchange programs, and other similar educational experiences.
5. Track key metrics related to increased diversity of the college.

### 7.8 Visibility

1. Intensify efforts to enhance the regional, national and international visibility of the College. These efforts will include areas such as the college's web site, publications, multi-media projects and public relations activities.
2. Pursue opportunities to increase membership of the faculty in the National Academy of Engineering, as well as furthered recognition as Professional Society Fellows and other appointments of distinction at the national and international level.
3. Promote programs and activities that improve national rankings of academic departments.
4. Encourage participation in research activities that will lead to publications in prestigious refereed journals as well as participation in national and international conferences.
5. Track, recognize, and publicize professional achievements of faculty, staff, current students, and alumni.

7.9 Facilities

1. Formulate, evaluate and develop long-term activities to ensure that the College will have state-of-the-art facilities.
2. Continue to maintain a comprehensive college-wide space management plan.
3. Insure that the college is actively involved in campus facility discussion/planning, including coordination of space planning with the Chancellor’s Office and with other colleges, as appropriate.
4. Initiate long term planning for a new multi-use engineering complex to replace Estabrook Hall and the Pasqua Engineering Building.

7.10 College Development

The College and its development staff will work with the College Board of Advisors, Departmental Industry Advisory Boards, corporate leaders, alumni and other friends of the college to expand its private support network and increase philanthropic giving. Priorities center on funding that will impact the college’s educational capabilities and growth trajectory, including:

1. Endowments for faculty salary support, especially professorships and chairs,
2. Gifts to fully endow the Jerry E. Stoneking engage™ Engineering Fundamentals Program,
3. General department endowments (with gift recognition/naming opportunities in new buildings or renovated spaces),
4. Transform the engineering campus (Cumberland Avenue to Neyland Drive) into a memorable student friendly location of choice for students to gather, study, and interact, both within the engineering buildings and outside of the buildings—a location that is reflective of a Top 25 college of engineering.
5. Student support, including graduate fellowships and undergraduate scholarships
6. Increasing engineering alumni support (increase both annual giving dollars and the number of engineering alumni giving to engineering) with the goal of doubling both in a five year period
7. Identification of private support funds needed to facilitate the university and state’s decision to construct a new multi-use engineering complex to replace Estabrook Hall and the Pasqua Engineering Building on those sites to insure continued growth of the college beyond 2015.