

**University of Tennessee
Nuclear Engineering Department**

Strategic Plan Update (2009)

**Identification of Objectives, Resources and
Opportunities**

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STRATEGIC PLAN NUCLEAR ENGINEERING DEPARTMENT UNIVERSITY OF TENNESSEE (December 2009)

1. 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 Nuclear Engineering Department, within 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.

In 1993 a strategic planning document entitled, "UTNE 2000," was formulated that delineated the department resources and opportunities. Department resources were reviewed in detail and the capacity of the department for research and teaching was extrapolated. In 1993 the department had 9.75 faculty and the undergraduate enrollment was 55. In 1993 the UTNE Department had 39 full time graduate research assistants and a total of 82 full and part time graduate students, a single undergraduate curriculum and two tracks in its graduate curriculum (Radiation Protection and Traditional Nuclear Engineering). The department reported \$1.4 million in sponsored research expenditures in 1993. The Strategic Plan was updated every two years until 2003.

In 2005, the College of Engineering engaged in a detailed, inclusive planning process involving all departments in the college, resulting in the release of a college-wide Strategic Plan late in the year. At that time, the Dean requested that subsequent department strategic plans follow a similar formatting, style, and terminology.

On May 1, 2006, the seven-member faculty of the Department of Nuclear Engineering met in an all-day retreat to consider our strategic direction. As a result of the meeting, this document was developed; it was later revised and approved by the faculty and in 2009 underwent its first revision.

Purpose and Organization of Report

The purpose of this strategic plan is to delineate a path forward for the Department of Nuclear Engineering. The strategies formulated in this plan are consistent with the vision and mission statements of the college and support the achievement of its goals. The plan has broad objectives that should guide the department's progress. It is anticipated that this plan will be revisited and updated on a periodic basis as conditions change.

Our approach to strategic planning follows the format of the college plan, with the additional enumeration of the specific resources, opportunities, and strategies appropriate to the environment in which the department now operates. The steps of the process (using the terminology defined in the glossary on the last page) are:

1. Creation of a vision statement to identify our ideal departmental state.
2. Creation of a mission statement to identify particular actions and products that will indicate the achievement of the vision.
3. Enumeration of the values that are shared by all members of the department, useful for measuring the quality of our goals and objectives.
4. Development of our goals, which are desired outcomes, places, conditions or possessions that will tell us that we have reached our vision and are performing our mission.
5. Development of a list of observable, measurable objectives that lead to the departmental goals.
6. Development of a list of resources available for achieving the objectives.
7. Development of a list of opportunities that currently present themselves.
8. Development of strategies: a list of actions that we think will lead to the achievement of our department objectives and goals.

2. VISION

The vision of the Nuclear Engineering Department of the University of Tennessee is to be recognized as an excellent higher-education nuclear engineering institution.

3. MISSION

The mission of the UT Nuclear Engineering Department is:

1. To produce high quality nuclear and radiological engineering graduates from undergraduate through the doctoral level in order to help meet the manpower needs of our state, region, nation, and the international community.
2. To conduct research that expands mankind's knowledge and capability in the area of nuclear and radiological engineering in order to help meet the needs of society.
3. To perform service for industry, government, professional organizations, and the public in areas related to nuclear and radiological engineering.

4. VALUES

As expressed in the document *A Context for Planning at The University of Tennessee: A Plan for the New Century*"(Adopted March 2002), the primary goals of a contemporary research-extensive university are to create and disseminate knowledge and prepare students to be thoughtful, productive citizens in a representative democracy. This document set forth the following university-wide values to be used for planning purposes:

- Excellence
- Integration of knowledge
- General education and professional practice
- Research and scholarship
- Undergraduate and graduate education
- Engagement
- Global and cultural diversity

5. GOALS

The faculty adopted a set of goals, the achievement of which will indicate that the vision and mission have been reached. The first six of these correspond to the goals laid out in the 2005 College Strategic Plan; the seventh goal is specific to the department:

- 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.
- Goal 6. Support the primary goals of the Quality Enhancement Program (QEP) of The University by focusing on increased and improved internationalization and intercultural relations.
- Goal 7. Be the provider of choice for undergraduate and graduate education in Nuclear Engineering.

6. OBJECTIVES

These goals are intended to be achieved through the accomplishment of the particular objectives listed below, organized according to the seven goals.

Goal 1: Achieve national and international recognition for the quality, productivity, and visibility of educational and research programs.

Related objectives:

- Develop a strategy to communicate departmental accomplishment to key stakeholders by the end of 2010.
- Improve national ranking of program (e.g., US News and World Report) to 10 or better by 2011 and 8 by 2014.

- Create one additional Governor's chair or endowed chair by 2013.
- Increase departmental endowment to \$5 million by 2013.
- Achieve or maintain course evaluations above the college average.
- Continue to average at least 1 major nationwide recognition of faculty and students per year by 2011 (e.g., faculty election as professional society fellows, design competition).
- Develop 1 or 2 new strategic research focus areas or centers to pursue large funding opportunities (e.g., Center for Radiation Transport and Detection) by 2013.
- Continue the colloquium program, using the opportunity to showcase UT research subjects at least three times per semester.
- Continue to promote FE exam performance among seniors.

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

Related objectives:

- Develop a recruitment plan to attract exceptional BS Graduates from outstanding institutions.
- Continue to graduate at least 30 undergraduates per year.
- Continuously fund 5 graduate students or post docs per full time equivalent faculty member (FTE) by 2012.
- Continuously fund 12 or more undergraduate research assistants.
- Create a departmentally-funded graduate student pool of 1 graduate student per FTE by 2011.
- Increase post-doc support to 5 by 2012.

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

Related objectives:

- Expand faculty to at least 13 FTE by 2014, with emphasis on replacing retiring faculty.
- Reduce faculty teaching load to an average of 3 sections (or fewer) per year by 2011.
- Develop a plan for faculty development (e.g., sabbaticals, summer fellowships, courses to improve teaching, etc.) by 2013.

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

Related objectives:

- Achieve international recognition of faculty prominence in his/her chosen field (as demonstrated by invited papers, conference chair positions, journal editorial positions, national and international committee memberships, consulting opportunities, etc.).

- Average at least three refereed journal publications per year per faculty by 2013.
- Achieve or maintain a level of external funding of at least \$300k per year by 2011 and \$350k per year by 2013.
- Graduate an average of at least 0.5 PhD students per year by 2011 and 0.7 PhD students per year by 2013.
- Continue minimum 25% recovery/release time.

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

Related objective:

- Develop a strategic plan for increasing the proportion of women and minorities among faculty and students.

Goal 6: Support the primary goals of the Quality Enhancement Program (QEP) of the University by focusing on increased and improved internationalization and intercultural relations.

Related objective:

- Encourage participation of students in university international programs.
- Compile a list of international opportunities by the end of 2010.
- Dedicate at least one departmental colloquium per year to promote international programs.
- Invite at least one international speaker per semester.

7. RESOURCES

The achievement of objectives requires the consumption or use of resources. A necessary step in the strategic planning process is to assign specific resources and opportunities to specific objectives. The purpose of this section is to identify all of the resources available to be applied to our objectives.

The resources that are available for use to reach our departmental objectives, organized into general categories are:

Resources available within the department for teaching, research, and service:

- Department Head time
- Faculty time
- Research faculty time
- Adjunct faculty time
- Student research time (full- and part-time)
- Support staff time

- Distance education infrastructure
- Classroom, office, and laboratory facilities on campus

Funding available for use:

- Funds supplied by university for teaching
- Supported research funds
- Endowments and enrichment funds
- Salary recovery funds
- Research Incentive Funds (RIF)

Resources outside the department

- Other research facilities available worldwide (esp. ORNL)
- Advisory board time and influence
- Industry connections
- Existing centers in the college and university
- University development office
- Current and former student connections

8. OPPORTUNITIES

Opportunities represent timely situations that can be taken advantage of as we apply our resources toward achieving our objectives. The following list is organized into general categories:

Current opportunities for research and service funding

- SNS, HFIR, NEUP, NRC, NSF funding
- Hydrogen economy research funding
- Homeland security research funding
- Advanced Fuel Cycle Initiative funding
- Reliability and Maintainability Center funding
- Budget earmarks funding: Expertise coupled to needs

- International collaboration: IAEA research funding through international partners
- National Nuclear Security Administration (NNSA) funding

Current opportunities to extend resources through research partnerships

- Teaming in research proposals: within department and with other departments
- Alliances with government laboratories and facilities, utilities, industry, and with other universities
- Potential for attracting hot runners (Heavy research and strong academic reputation) among experienced researchers
- Interdepartmental research emphasis in many research programs

Current opportunities to extend funding resources for teaching and non-funded research

- Availability of faculty and student scholarships and awards

Current opportunities to increase department visibility

- Faculty membership on professional society boards
- Faculty membership on proposal review committees
- Faculty membership on advisory committees
- Faculty membership on scientific committees

9. STRATEGIES

The culmination of the planning effort lies in the assignment of responsibilities to carry out specific, prioritized strategic activities, which apply identified resources to current opportunities in order to meet objectives. The specific strategies that follow are arranged based on the person responsible for their success. (The strategies do not identify the resources or opportunities to use, leaving this task to the responsible party.)

The first category comprises the achievement of objectives that fall under the responsibility of each individual faculty member as part of the development and maintenance of a successful program of teaching, research, and service.

In this section the word “average” means a two year average.

Strategy 1: Each faculty member of the Department should continue or initiate activities that will enhance his teaching effectiveness in order to:

- Achieve or maintain course evaluations above the college average;
- Graduate an average of at least 0.5 PhD students per year by 2011 and 0.7 PhD students per year by 2013; and
- Take advantage of opportunities for faculty development (e.g., sabbaticals, summer fellowships, courses to improve teaching, etc.) by 2013.

Strategy 2: Each faculty member of the Department should continue or initiate activities that will enhance his research and service activities in order to:

- Achieve international recognition of prominence in his chosen field (as demonstrated by invited papers, conference chair positions, journal editorial positions, national and international committee memberships, consulting opportunities, etc.);
- Average at least three refereed journal publications per year by 2013;
- Achieve or maintain a level of external funding of at least \$300k per year by 2011 and \$350k per year by 2013;
- Increase post-doc support to .5 per FTE by 2012.
- Continuously fund at least 5 graduate students by 2012; and
- Continue minimum 25% recovery/release time.

The second category comprises those activities and policies that require department-wide administration or that require interaction with college and university administration personnel. These are reserved for the department head and the staff under his direction.

Strategy 3: The Department Head should continue or initiate department-wide policies and activities in order to:

- Develop and implement a marketing strategy to communicate departmental accomplishments to key stakeholders by the end of 2010;
- Develop and implement a recruitment plan to attract exceptional BS graduates from outstanding institutions;
- Create a departmentally-funded graduate student pool of at least 1 graduate student per FTE by 2011;
- Develop a strategy to increase the proportion of women and minorities among faculty and students;
- Continue to graduate at least 30 undergraduates per year;
- Encourage the participation by undergraduates as research assistants;
- Continue the colloquium program, using the opportunity to showcase UT research areas at least three times per semester;
- Continue to average at least 1 major nationwide recognition of faculty and students per year by 2011 (e.g., design competition, faculty election as professional society fellows);

- **Continue to promote FE exam performance among seniors;**
- **Encourage student participation in internships and the college co-op program;**
- **Encourage participation of students in university international programs;**
- **Continue the distance education program with emphasis on minimizing faculty workload;**
- **Reduce faculty teaching load to an average of 3 sections (or fewer) per year by 2011;**
- **Encourage faculty members to form strategic research focus areas or centers.**

Strategy 4: The Department Head should interact with the college and university administration in order to:

- **Expand faculty to at least 13 FTE by 2014 with an emphasis on replacing retiring faculty and promoting diversity;**
- **Anticipate the needs of the nuclear engineering industry in replacing retiring faculty.**
- **Increase departmental endowment to \$5 million by 2013; and**
- **Create at least one additional Governor's chair or endowed chair by 2013.**

The remaining objectives that were identified but not addressed in the above strategies:

- **Improve national ranking of program (e.g., US News and World Report) to 10 or better by 2011 and 8 by 2014;**

are thought by the faculty to be natural by-products of the four identified strategies.

Glossary of Terms Used

Vision Statement: Sets out the reason for the organization's existence and a "snapshot" of the ideal state that the department aims to achieve.

Mission: The particular actions and products that will accompany when the achievement of the vision. What things we will be doing and what things we will be producing when the ideal state is reached.

Values: Shared norms that provide a guide to desired outcomes of our activities.

Goals: Desired outcomes, places, conditions or possessions that will tell us that we have reached our vision and are performing our mission.

Objectives: Desired intermediate observable and measurable outcomes, places, conditions or possessions. Objectives are either milestones on the way to goals or (more commonly) continual conditions that, if they exist, will lead ultimately to the achievement of goals.

Priorities: A rank of objectives in order of importance.

Environment: Combination of resources, opportunities, and risks.

Resources: Those things available to use or manipulate in order to effect change.

Opportunities: Situations existing or created that facilitate attainment of objectives

Risks: Events or situations that could adversely affect one's current position or attainment of objectives.

Strategies: Delegated (i.e., to a specific person) actions that are taken to align resources with opportunities such that the objectives of the operating unit are optimally achieved. The plan should mitigate risks while honoring the priorities assigned to the objectives.