

### **Comprehensive Standard 3.3.1.1**

The institution identifies expected outcomes, assesses the extent to which it achieves these outcomes, and provides evidence of improvement based on analysis of the results in the following areas: educational programs, to include student learning outcomes.

Compliance       Non-Compliance

#### **Proof/Explanation:**

Tennessee Technological University (TTU), as a member of the Tennessee Board of Regents (TBR) system, is required to participate in ongoing, integrated, and institution-wide evaluation processes that are research based. These research-based evaluations are guided by clearly defined program goals that are linked to University-wide strategic planning goals, as well as TBR system-wide strategic goals. Student learning outcomes are identified and assessed by each academic unit to monitor and verify student progress. This interim report provides evidence of ongoing evaluation of program goals and student learning outcomes.

#### Identification of Expected Outcomes

Each academic unit on campus has developed specific program goals that are unique and appropriate for that academic unit. Unit Program Goals are based not only on TTU strategic plans, but in many cases, accreditation requirements (1). For units that do not hold accreditation, academic reviews/audits and program reviews are in place to monitor progress toward goal achievement. TTU offers a variety of undergraduate and graduate degrees, including distance learning programs. Program goals for each of these types of degrees were reviewed for compliance.

Each academic unit on campus has developed specific student learning outcomes that are unique and appropriate for the degree programs of that unit. Student learning outcomes provide definition of student learning and how that learning is measured for progress. Student learning outcomes for each academic unit were reviewed for compliance.

#### Assessment of the Extent to Which Outcomes Have Been Achieved

##### ***University-wide Assessments***

The University provides a battery of assessments and makes these results readily available to academic and administrative units across campus for the purpose of strategic planning. These assessments include

- Major Field Exams (administered by individual departments)
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The **California Critical Thinking Skills Test (CCTST)** serves as TTU's general education exit exam and is given to graduating seniors at the end of each semester, with the results being available at the beginning of the next semester, broken down into disciplines and colleges. Additionally, various programs across the University employ TTU's own Critical Thinking Assessment Test (CAT) test to assess their students at various stages of their career as students.

The **National Survey of Student Engagement (NSSE)** obtains information from random samples of first-year and senior students about the nature of their undergraduate experience. First offered in 2006 and then again in Spring 2009, 2011, and 2013, the NSSE replaced the Enrolled Student Survey (ESS) in 2005. Results are made available in a discipline-specific format and comparison is made with TTU's Carnegie Peers as well as other Tennessee universities.

**IDEA** evaluations are administered in classrooms during the last two weeks of every semester and results are made available at the beginning of the following semester. Academic chairs are provided these results by their own faculty. Frequent IDEA evaluation is required according to a policy statement published in the Faculty Handbook (4). Tenure-track, full-time temporary, and part-time faculty, as well as teaching assistants with grading responsibility for courses have all their courses evaluated every semester (summer courses are excluded). All tenure-track faculty (4-1) (4) (as) 810.137-0

Discussions of pedagogical developments now regularly take place between faculty members, and six of seven faculty are now considered to be employing some form of active learning in at least one of their classes. With NSF grant support, two faculty have since developed a guided-inquiry style curriculum for the PHYS 2010 course, and the average gain for these pilot sections has been around 55%. The most recent physics alumni survey (Fall 2008) revealed that lack of emphasis on computational techniques was a perceived weakness of the program. In response, the department developed a coordinated program to address computation as one of the initiatives proposed in its 2009 academic audit. The department is now in the second year of implementation of this plan.

The Chemistry Department has been monitoring a new critical thinking assessment indicator on the Chemistry Major Field Exam. When compared to the median scores of 227 other universities, TTU chemistry graduates scored in the following national percentiles (2007-2010); 44, 41, 44 and 64%. The Department points to the importance of undergraduate research as a means by which students can increase critical thinking and problem-solving abilities. In the last two years, as a result of these efforts, approximately 50% of their students have been involved in undergraduate research. Each year since 2007, the TTU Chemistry department has sent either the highest or the second highest number of undergraduate students to the national American Chemical Society (ACS) meetings to present the results of their research.

In the Mathematics B.S. program,

History 3410 with those from History 4990, department faculty can demonstrate value-added research skills among their graduates.

In the **College of Engineering** the Electrical and Computer Engineering Faculty have established a new Electrical Energy and Power lab to improve laboratory instruction to students based on feedback received from their accrediting body and alumni surveys. Within the department of Chemical Engineering, feedback on program goals and student learning outcomes was used to initiate a new Biomolecular Engineering concentration (within the BS-Chemical Engineering Degree) in 2007. Currently the concentration has enrolled 80 students being the fastest growing concentration within the College of Engineering and the only one of this type within Tennessee. As part of the continuous improvement efforts in the Chemical Engineering program, a new and more pedagogically coordinated sequence for the transport phenomena courses is being tested. This provides a “student learning-center” platform. The Department of Chemical Engineering focuses on three pillars for the education of the future chemical engineers, i.e. hands-on, team-based learning, and critical thinking approaches. The anchoring pedagogical model for this approach is the Hi-Pe-Le that was highlighted by the National Science Foundation ,,,,

In the **College of Education**, curriculum changes have resulted from assessment findings in the graduate program in counseling and psychology. All students complete a thesis or applied research course project that meets specific criteria established by the graduate faculty and that is consistent with professional standards in the field. Faculty observations of weaknesses in student work have led to modifications in the non-thesis option and the development of a new course in applied research that gives students more experience in critically evaluating research and interpreting implications of research studies in their areas of concentration. This course culminates in a written and

## University Initiatives to Promote Program and Learning Outcomes Assessment

The University has made considerable efforts to foster a culture of assessment-based planning among academic units. Dr. Barry Stein served as Director of Planning from 2000 –2009. His responsibilities included coordinating, analyzing, and reporting on strategic planning; assisting units with program and learning outcome plans; organizing, analyzing, and reporting on various campus-wide assessment activities including general education assessment, critical thinking assessment, teaching evaluations, and coordinating the distribution of assessment and planning information through the web. He also headed the development of the University's QEP proposal. A separate QEP Director, Dr. Thomas Timmerman, was appointed to coordinate the SACS-approved QEP. A web-based Institutional Effectiveness System was implemented that integrated unit planning and University-wide strategic planning. This system was subsequently expanded to include program and learning outcomes for each program at the University. In 2009 the University separated planning and assessment responsibilities. Planning activi

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While several departments on campus already have an active program in undergraduate research, a committee of six faculty members across disciplines assembled in 2008, and proposed that a greater emphasis on undergraduate research and scholarly activity across the university would not only assist in addressing our commitments to lifelong learning and real world problem solving, but would also enhance the capabilities of individual units to support undergraduate research. This has evolved into the new **URECA! Program** (8). The URECA! (**U**ndergraduate **RE**search and **C**reative **A**ctivity) Program is providing monetary assistance (beginning Spring 2012) for undergraduates who pursue research and creative activities at TTU through academic year mini-grants, summer grants with stipends, and travel grants for students and their accompanying faculty mentors. The program is administered by the Office of Research and Graduate Studies.

Many academic units on campus value effective communication and have set learning goals for their students aimed at enhancing communication skills. The University is supporting these efforts by creating its own venue for students to practice presenting results of their research. Sponsored by the TTU Office of Research and Graduate Studies, the TTU Student Research Day (9) has been in operation since Spring 2007. It has grown steadily to well over a hundred presentations and involves undergraduate and graduate students (10).

In 2010, the General Education Award for Outstanding Teaching was created to recognize exemplary teaching in the 1000- and 2000-level courses that fulfill general education requirements in communications, history, humanities/fine arts, math, natural sciences, and social/behavioral sciences. This award recognizes the value and innovation being done in the introductory-level courses. The faculty who teach these courses lay the foundation for a successful college experience and, hopefully, foster an interest in lifelong learning (11).

In order to enhance the learning environment, the main library and media center has undergone extensive renovations. In Fall 2011, a new Learning Commons was added (12). The Learning Commons provides presentation, group collaboration, and group study rooms and technologies to support distance learning.

### **Supporting Documentation:**

1. [http://www.tntech.edu/files/sacscoc/compliance/TTU\\_Perf\\_Funding\\_2010-2015\\_Planning.pdf](http://www.tntech.edu/files/sacscoc/compliance/TTU_Perf_Funding_2010-2015_Planning.pdf)
2. [http://www.tntech.edu/files/sacscoc/compliance/SACSCOCTypes\\_of\\_Assessment.pdf](http://www.tntech.edu/files/sacscoc/compliance/SACSCOCTypes_of_Assessment.pdf)
3. <http://www.tntech.edu/strategicplanning/ttu-assessment-data/>
4. <http://www.tntech.edu/facultyhandbook/evalofinstruction/>
5. <http://www.tntech.edu/cob/fatal-five/>
6. <http://www.tntech.edu/cat/home/>
7. <http://www.tntech.edu/reslife/livinglearningvillages/>
8. <http://www.tntech.edu/research/ureca-program/>
9. <http://www.tntech.edu/research/events/>
10. <http://cmat.tntech.edu/snorthrup/ResearchDay.pdf>
11. <http://www.tntech.edu/pressreleases/ttu-rewards-exemplary-general-education-professors/>
12. <http://www2.tntech.edu/library/learningCommons/index.asp>