

3.5.1

Educational Programs: Undergraduate:General Education Competencies

The institution identifies college-level general education competencies and the extent to which students have attained them.

Judgment

Compliance Partial Compliance Non-Compliance Not Applicable

Narrative

The Tennessee Technological University (TTU) General Education program is founded on the principle that all students should develop college-level competencies and perspectives that enhance their professional and personal lives throughout their program of study but grounded in designated lower-division courses in communication, mathematics, social/behavioral and natural sciences, fine arts and humanities, supporting the University's vision of "producing practical, ready-to-work graduates from a broad range of academic disciplines prepared to compete in a technologically driven world." The General Education program thus includes courses that develop a student's ability to

- think logically, critically, and creatively
- communicate effectively both orally and in writing
- read extensively and perceptively
- explore moral and aesthetic values, social relationships, and critical thinking through the humanities
- understand the importance of key social institutions, ethics and values, and how individuals influence events and function with others in these institutions throughout the world
- appreciate creative and aesthetic expressions along with their impact on individuals and cultures
- express, define, and logically explore questions about the world through mathematics
- use computer technology to communicate and to solve problems
- use acquired facts, concepts, and principles of the physical and natural sciences in applying the scientific process to natural phenomena
- perceive the importance of wellness and values in human life
- manifest a commitment to lifelong learning

The specific structure of the General Education program was developed as a system-wide initiative of the Academic Affairs office of the Tennessee Board of Regents (TBR), of which TTU is one of six constituent universities, along with 13 community colleges, as described in the 2002 "Proposal for a Lower Division General Education Core" developed by an ad hoc TBR committee [1]. A common rubric of 41 credit hours in six General Education categories was established by the approval of this proposal, effective Fall 2004, as follows:

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|------------------------------|--|
| • Communication | 9 credit hours (6 writing, 3 oral) |
| • History | 6 credit hours |
| • Humanities/Fine Arts | 9 credit hours (3 must be in literature) |
| • Mathematics | 3 credit hours |
| • Natural Sciences | 8 credit hours |
| • Social/Behavioral Sciences | 6 credit hours |

Common learning outcomes were also established for each category [2]. As described in the CR 2.7.3 report, courses eligible to fulfill these requirements are identified by each campus through its regular curricular development and review process, but must also be approved by the TBR General Education Advisory Committee, a statewide committee with members from each TBR campus, which determines

whether proposed courses meet the prescribed outcomes set for each General Education area, and otherwise appear to be sufficiently rigorous and not narrowly intended for a particular major or professional training. This approval process at the campus and state-system levels also assures that each course approved for General Education is a college-level course in its content and methods, and sufficiently broad in its focus to be beneficial to a wide range of students.

While the competencies listed above reflect the larger purpose of the TTU General Education program, assessment activities have focused on several "core competencies" that are most essential to the academic and lifelong success of TTU students regardless of major. Thus, in accordance with TBR guidelines all TTU students are required to complete two semesters of composition (ENGL 1010 and ENGL 1020), a course in oral communication (SPCH 2410 or PC 2500), and, as part of the nine-hour requirement in humanities/fine arts, at least one approved ENGL literature course. The complete list of courses approved for the TTU General Education Core as of Fall 2014 is published in the TTU Undergraduate Catalog [3].

The attainment of General Education competencies is measured via direct and indirect methods. Beginning Fall 2009, Tennessee Technological University (TTU) has participated in the Tennessee Board of Regents (TBR)-wide assessment of core-competency areas within the general education program:

- Written communication
- Oral communication
- Mathematics
- Critical thinking

Each of these areas is assessed using direct methods based on work embedded within a particular course or performance on a nationally normed testing tool such as the California Critical Thinking Skills Test (CCTST). TTU developed a pilot assessment plan in 2008 [4], establishing scoring rubrics within guidelines formulated by TBR [5], and annually submits a report that shows assessment results of key learning outcomes within each of these areas:

Communication (oral and written):

- Students are able to distill a primary purpose into a single, compelling statement.
- Students are able to order major points in a reasonable and convincing manner based on that purpose.
- Students are able to develop their ideas using appropriate rhetorical patterns (e.g., narration, example, comparison/contrast, classification, cause/effect, definition).
- Students are able to employ correct diction, syntax, usage, grammar, and mechanics.
- Students are able to manage and coordinate basic information gathered from multiple sources.

Mathematics:

- Students are able to use mathematics to solve problems and determine if results are reasonable.
- Students are able to use mathematics to model real-world behaviors and apply mathematical concepts to the solution of real life problems.
- Students are able to make meaningful connections between mathematics and other disciplines.
- Students are able to use technology for mathematical reasoning and problem solving.
- Students are able to apply mathematical and/or basic statistical reasoning to analyze data and graphs.

Critical Thinking areas:

- Analysis
- Interpretation
- Inference
- Evaluation
- Explanation
- Induction
- Deduction

A compilation of results from all TBR universities and community colleges was compiled for 2010-11 but has not been updated since [6].

General Education: Direct Assessment

As discussed in the 2008 assessment plan [4], the following direct measures are used to determine attainment of the learning outcomes in the core competency areas:

1. Writing skills are measured using a random sample of essays from approximately 20 percent of the students enrolled in spring semester sections of ENGL 1020, the second course of the two-semester freshman writing sequence.
2. Oral communication skills are measured using a scoring template that measures the same five learning outcomes assessed for writing. All students (about 400) in fall semester sections of SPCH 2410, Introduction to Speech Communication, which the majority of TTU students take to fulfill the oral communication course requirement, are scored on a speech assignment common to all sections.
3. Mathematics learning outcomes are measured by means of a subset of items in a late-semester examination in MATH 1130, College Algebra, a course populated primarily, but not exclusively, by students whose majors do not require additional mathematics course work.
4. Critical thinking ability is assessed via the CCTST, administered to all seniors, typically in their final semester. Though a direct assessment of critical thinking skills, it may be considered an indirect measure of the General Education program more generally because it assesses the cumulative effect of TTU students' undergraduate curricula and their level of competency in analysis, interpretation, inference, evaluation, explanation, induction, deduction.

The assessment results in these areas from the past three years indicate satisfactory progress for TTU lower-division students [7]. Results from the CCTST, a nationally-normed assessment tool that students take toward the end of their degree programs, have been consistently above the national mean and therefore indicate adequate attainment in critical thinking [8].

A direct assessment of other areas of General Education (humanities/fine arts, natural science, history, social/behavioral sciences) is also conducted in several other widely-taken course areas, including:

- History (HIST 2010, 2020) [9]
- Humanities/Fine Arts (HIST 1010, 1020, 1110, 1120, 1310) [9]
- Natural Sciences (CHEM1110, 1120; PHYS 2010, 2110) [10] [11]

These results generally demonstrate the competence of TTU students in attaining the key competencies in those course areas, and describe efforts to improve learning outcomes such as the LEAP course redesign in PHYS 2010.

General Education: Indirect Assessment

Because a useful picture can emerge from such indirect methods as self-assessment and opinions provided by employers of TTU graduates, the University participates in the National Survey of Student Engagement (NSSE) and conducts, at multi-year intervals, surveys of TTU alumni and employers. These serve to complement the direct measures described above in demonstrating that TTU students are attaining the kind of competencies that are essential to their lifelong success, professionally and personally.

The **Alumni survey** (2011-12, the most recently administered such survey) shows that a large majority of TTU alumni consider their TTU education to have prepared them well for their further educational endeavors and their careers [12]. The results of survey questions that are most relevant to General Education may be found in Table 6 of the report (page 6), with average response to the question of "Acquiring a broad general education" rating a solid 3.0 on a 4.0 scale, along with similar scores in other areas related to critical thinking and communication. The comparatively low score of

2.3 on the question of “Understanding of people of other racial and ethnic backgrounds” indicates the need for current TTU programs such as Center Stage, and the Global Village residential hall, established in 2013 (i.e., after the survey was conducted), to encourage American-born students to live and study with international students.

The **Employer survey** (2012-13) also indicates satisfaction with the capabilities of TTU graduates in the workplace, including those areas most related to General Education such as critical thinking, oral and written communication, and competence in “diverse perspectives and intercultural knowledge,” with all such measures rating at least 4 (“good”) on a 5-point scale, as noted in Figure 5 and Table 1 of the report (pages 5-6) [13].

NSSE results (2013-14) include indicators of essential academic experiences and competencies, including an “Academic Challenge” assessment [14] and a “Global Perspectives: Cognitive and Social” assessment [15]. Each compares responses from first-year students and seniors, offering some insight into the educational impact of the undergraduate program at TTU. The “Academic Challenge” section covers areas that are relevant to the “core competencies” areas of General Education, including critical thinking; TTU students show gains in each of these areas from the freshman to senior years that are comparable to those of the other institutions in the survey, though the starting and ending points are slightly lower than those of the comparison groups. The “Global Perspectives” results are most closely related to the learning outcomes in humanities/fine arts and social/behavioral sciences, and show that TTU students’ self-assessments are generally in line with those of their peers in the national comparison group, as example results from the report suggest [16].

General Education Student Learning Support and Initiatives

TTU undertakes a variety of efforts intended directly to improve student learning in General Education courses and experiences beyond the classroom:

- Two NSF-funded grant projects for improved teaching methods in introductory-level physics courses [11] and in the pre-calculus course that many students must take prior to enrolling in the calculus courses required in their majors
- Tutoring and support in writing, mathematics, chemistry, and other areas has also been enhanced by the establishment of a “learning commons” in the renovated first floor of the Volpe Library.
- Six Learning Villages, led by tenured faculty members released from 50 percent of their teaching loads, offer General Education sections for their residents and others as capacity permits; each Village also supports “academic peer mentors,” experienced students who are available to tutor mainly first- and second-year students living in the village.
- The Math Emporium was opened in Fall 2014 and creates a guided learning environment that replaces the more traditional lecture approach in several foundational mathematics courses.
- The Writing Studio is a new venture for the Department of English as of Spring 2015, and serves the needs of writers in the University community beyond the required freshman courses, thus sustaining support of foundational writing skills of upper-division and graduate students.
- Two awards for excellence in general education teaching are given each year, highlighting and publicizing successful instructional methods.
- Study-abroad opportunities supported by a dedicated student fee and available to students in all majors.
- The Center Stage program, initiated specifically as a general education activity for students, offers frequent opportunities for students to see presentations on issues of social diversity as well as musical, theatrical, literary, and visual arts events.

Conclusion

The TTU General Education program focuses on core competencies for success in college and career, and includes a full range of coursework designed to enhance students’ understanding of society, the natural world, and cultural values and practices, with the larger goal of developing critical thinking skills and lifelong success. Direct and indirect measures, along with various enhancement programs and activities, show that TTU students attain these competencies and perspectives; therefore, TTU is in compliance with Comprehensive Standard 3.5.1.

Sources

-  [01] Proposal for the Establishment of a Lower Division General Education Core 2002
-  [02] General Education Learning Outcomes Summary
-  [03] University Requirements for a Baccalaureate Degree
-  [04] TTU Gen Ed Plan
-  [05] TBR General Education Assessment Proposal March 2007
-  [06] Gen Ed Assessment System Report_2010_11
-  [07] Summary Tables_Core Competencies 2012_15
-  [08] CCTST Report for TTU 2014_2015
-  [09] TTU History_General Education Report
-  [10] Assessment of General Chemistry Knowledge with ACS National Exam
-  [11] Physics Assessment
-  [12] Alumni Survey 2011_12
-  [13] Employer Survey 2012_13
-  [14] NSSE Academic Challenge TTU Freshman_Senior Comparison 2014
-  [15] NSSE Report_TTU Students Global Perspectives 2014
-  [16] TTU Results Excerpt from NSSE Global Perspectives 2014