

2.7.2

Program Content

The institution offers degree programs that embody a coherent course of study that is compatible with its stated mission and is based upon fields of study appropriate to higher education.

Judgment

Compliance Partial Compliance Non-Compliance Not Applicable

Narrative

All degree program requirements at Tennessee Technological University (TTU) are aligned with the mission and vision of the institution [1] and are based upon fields of study appropriate to higher education.

TTU's Mission and Vision

TTU's mission reads as follows:

Tennessee Technological University's mission as the state's only technological university is to provide leadership and outstanding programs in engineering, the sciences, and related areas that benefit the people of Tennessee and the nation. The University also provides strong programs in the arts and sciences, business, education, agriculture and human ecology, nursing, music, art and interdisciplinary studies. Tennessee Tech serves students from throughout the state, nation, and many other countries, but it retains a special commitment to enrich the lives of people and communities in the Upper Cumberland region of Tennessee.

In addition to the mission statement, TTU also has the following vision for its future:

Tennessee Tech will be nationally recognized as a leading technological university in the South, providing academic, economic and cultural leadership in the region and producing practical, ready-to-work graduates from a broad range of academic disciplines prepared to compete in a technologically driven world.

To carry out its mission and vision, TTU has developed a new strategic plan (Flight Plan) [2] with four focus areas:

1. Improve undergraduate student experience
2. Transform technology
3. Create distinctive programs and invigorate faculty
4. Expand financial resources and modernize infrastructure

Courses and Programs Compatible with TTU's Mission and Vision

TTU was founded as Tennessee's comprehensive technological university and emphasizes technology when preparing its students to succeed in a wide range of disciplines. TTU provides strong programs in its seven colleges: Agriculture and Human Ecology, Arts and Sciences, Business, Education, Engineering, Interdisciplinary Studies, and Graduate Studies, and its Whitson-Hester School of Nursing. In these colleges and the Whitson-Hester School of Nursing, TTU offers 40 bachelor's degrees with a wide variety of concentrations and 24 graduate degrees that include master's, specialist, and doctoral degrees in a variety of disciplines. The Tennessee Higher Education Commission Academic Program Inventory lists all approved, active programs and includes the corresponding Classification of Instructional Program (CIP) codes used for federal (NCES IPEDS) reporting [3]. In addition to its

established programs, TTU develops new courses and programs at the undergraduate and graduate levels that support its mission and vision. Selected examples are described below.

Undergraduate programs. The general education component of all baccalaureate degree programs is consistent with that of all other Tennessee Board of Regent (TBR) institutions. The curriculum of each major program is comparable to that of similar majors at other accredited institutions of higher education.

Spanish for Health Services. Spanish 1015 is an undergraduate course developed to address the growing Hispanic population in Tennessee and the need for health care professionals to communicate with Spanish-speaking patients. The School of Nursing recognized this need and requested that the Department of Foreign Languages create a Spanish course to teach Spanish to its nursing students. This course was subsequently created, moved through the approval process (described below), and taught for the first time in Fall 2006. It is one example of how one unit (Department of Foreign Languages) supports another (School of Nursing) to produce an outstanding program aimed "to benefit the people of Tennessee and the nation." Spanish for Health Services cannot be used to satisfy a general education requirement.

Mechatronics concentration. First offered in Spring 2012, this concentration is an example of a new, innovative technological program at TTU. Through this program, students enrolling in either electrical (CIP code 09.14.1001.00) and computer (CIP code 09.14.0901.00) engineering or mechanical (CIP code 09.14.1901.00) engineering are able to participate in the mechatronics curriculum program, which will lead to a concentration in mechatronics along with a Bachelor of Science in their respective (Electrical or Mechanical) Engineering degree. Mechatronics is the interdisciplinary field of engineering that deals with the design of products whose function relies on the integration of mechanical, electrical, and electronic components connected by a control scheme. Mechatronics is a vital component in modern product design and advanced manufacturing. Engineers with training in mechatronics are in high demand with employers. The TTU mechatronics concentration prepares engineers who are familiar with and competent in cutting-edge technology in both mechanical, electrical, and computer engineering and are prepared to develop innovative products to address societal needs.

Computer Science with Information Assurance CyberSecurity. Another new program at TTU, a bachelor's degree in Computer Science (CS) (CIP code 06.11.0701.00) with an Information Assurance and CyberSecurity (IAC) concentration, includes a computer science background with appropriate security concepts that are applicable to computer and information systems security. The IAC concentration directly contributes to regional and national cybersecurity workforce development. The number of security professionals worldwide is expected to increase to nearly 4.2 million by 2015. Despite the growing demand and tremendous job opportunities in industry and government, cybersecurity remains an area where there is a significant shortage of skilled professionals regionally, nationally, and globally. TTU endeavors to prepare its students to meet this demand, hence fulfilling the University's mission statement.

Graduate programs. Many of TTU's graduate programs either teach content in innovative ways using technology or are on the cutting edge of technological research and disseminate this knowledge through innovative programs. For example, TTU developed a new degree program that aims to prepare students for careers dedicated to protecting the planet, a Professional Science Master's degree (CIP code 01.03.0103.00) with a concentration in Environmental Informatics. This hybrid program, which combines a variety of disciplines (business, agriculture, engineering, geology) and offers classes online and in the classroom, directly addresses a need to prepare students to become environmental scientists. This program illustrates how the University continues to develop new graduate programs designed to meet societal and professional needs. A news release from January 23, 2014, provided in the Evidentiary Documents describes the program [4].

Program Development and Approval Process

Faculty members at the departmental level typically generate curriculum development and participate in the subsequent approval process. Departments make proposals to a college-level committee. If the courses in question are general education courses, the University General Education Committee must

first approve them before they move to the University Curriculum Committee. Proposals approved by the college-level committee are then reviewed by the University Curriculum Committee (if undergraduate level) [5] or the Graduate Studies Executive Committee (if graduate level) [6], and, if approved, submitted to the Academic Council. Proposals for new programs approved by the Academic Council are submitted to the Provost and Vice President for Academic Affairs. Finally, proposals approved by the Provost's Office are submitted to TBR for final approval. This process [7] not only ensures the coherence of programs, but also compatibility with TTU's mission. All distance education degree programs and courses adhere to the same approval process.

Sequencing of Courses and Progressive Learning

New undergraduate and graduate courses and changes in these curricula reflect TTU's mission to "provide leadership and outstanding programs . . . that benefit the people of Tennessee and the nation." The Spanish for Health services course described above is an example of this important mission. It has the course designation SPAN 1015 because it is meant to be taken by first year, undergraduate students. The sequencing of this course and TTU courses in general is determined by their content and the year in which the student would take the courses. See Table 1, taken from the Definition of a Credit Hour section of the Undergraduate Catalog [8].

1001-1999	Courses for Multiple Credit
1000-1999	Freshman Level
2000-2999	Sophomore Level
3000-3999	Junior Level
4000-4999	Senior Level
5000-5999	Graduate Level
6000-6999	Graduate Level (Restricted to Graduate Students)
7000-7999	Advanced Graduate

Appropriateness to Higher Education

TTU's degree programs are consistent with those offered by 34 peer institutions as determined by IPEDS peer-analysis data. These peer institutions were selected according to the Carnegie Classification of Master's Colleges and Universities (larger programs), public designation, and enrollment of a similar size. Of particular interest in this report is the number and types of degrees awarded by TTU as compared to those of the peer institutions. In 2011-2012, TTU awarded 1,704 bachelor's degrees, 347 master's degrees, and 18 doctoral degrees compared to 1,574 bachelor's degrees, 388 master's degrees, and 0 doctoral degrees awarded by its peer institutions.







Conclusion

TTU offers degree programs that embody a coherent course of study that is compatible with its stated mission as evidenced by the concentration in mechatronics and the concentration in information assurance with cybersecurity. These fields of study are appropriate to higher education as evidenced by comparative data with peer institutions as well as federal recognition via NCES IPEDS reporting codes. Program content demands increasing levels of integration of knowledge as demonstrated by the sequencing of courses. Therefore, TTU is in compliance with Core Requirement 2.7.2.

Sources

 [1] TTU Mission and Vision

 [2] TTU Flight Plan

-  [3] THEC Academic Program Inventory
-  [4] Press Release on New Professional Science Masters in Environmental Informatics
-  [5] Procedures and Guidelines of the University Curriculum Committee
-  [6] Graduate Studies Executive Committee Policy 272
-  [7] Approval of Academic Programs Units and Modifications Policy 224
-  [8] Credit Hours Policy 222