



TENNESSEE HIGHER EDUCATION COMMISSION

REGULAR CALENDAR ITEM: I.D.

MEETING DATE: May 15, 2025

SUBJECT: New Academic Program
Tennessee Technological University
Interdisciplinary Computing, Bachelor of Science (BS)

ITEM TYPE: Action

PROGRAM OVERVIEW

Title and Designation	Interdisciplinary Computing, Bachelor of Science (BS)
Concentrations	None
Accreditation	No programmatic accreditation applicable.
CIP Code and Description	11.0104 (Informatics) A program that focuses on computer systems from a user-centered perspective and studies the structure, behavior and interactions of natural and artificial systems that store, process and communicate information. Includes instruction in information sciences, human computer interaction, information system analysis and design, telecommunications structure and information architecture and management.
SOC Code and Title	15-1221 (Computer and Information Research Scientists) 15-1252 (Software Developers) 15-1253 (Software Quality Assurance Analysts and Testers) 15-1255 (Web and Digital Interface Designers)
Credit Hours	120
Implementation Date	August 1, 2025
Modality and Delivery Site	Majority On-Ground/Hybrid
Department/College	College of Interdisciplinary Studies, School of Interdisciplinary Studies
Governing Board Approval Date	April 30, 2025

ALIGNMENT WITH STATE MASTER PLAN AND INSTITUTIONAL MISSION/STRATEGIC PLAN

Tennessee Technological University (TTU) proposes a Bachelor of Science (BS) in Interdisciplinary Computing. The proposed program is designed to prepare graduates to apply computing solutions to diverse fields beyond traditional computer science. Rather than focusing on programming skills or theoretical computer science, this innovative degree combines computing knowledge with expertise in another discipline area, allowing students to bridge technology with fields such as business, healthcare, agriculture, or the arts. The proposed program represents a strategic response

to Tennessee's evolving workforce needs and educational priorities. The program directly addresses multiple initiatives within THEC's Master Plan, particularly enhancing family prosperity by creating a flexible, interdisciplinary degree path for Tennesseans with some college credit but no degree. Its interdisciplinary design accommodates course credits from various disciplines, preserving financial aid eligibility and supporting successful degree completion. It also aligns with the Master Plan's "Enabling the Competitive Edge" framework through its accessible structure that does not require advanced mathematics prerequisites while still developing critical competencies in artificial intelligence, data analysis, and professional communication. All students in the program will complete at least 10 credit hours of experiential education, providing them with opportunities to apply classroom learning to real-world scenarios in cross-disciplinary teams.

The program exemplifies Tennessee Technological University's (TTU's) commitment to preparing career-ready graduates while addressing state workforce needs. By combining computing expertise with discipline-specific knowledge, the program delivers practical, applied education while maximizing institutional resources through collaboration between the College of Engineering and the College of Interdisciplinary Studies. The program's emphasis on industry partnerships, experiential learning, and real-world problem solving aligns with TTU's reputation for producing graduates who immediately contribute to Tennessee's economic growth and technological advancement. This approach demonstrates TTU's responsiveness to evolving workforce demands and strengthens the state's competitive position in the technology sector through innovative educational pathways.

PROGRAM DUPLICATION

The program is unique among Tennessee public and private institutions, as there are currently no programs in the state that share the same Classification of Instructional Programs (CIP) code: 11.0104 - Informatics. While several universities offer computing programs with similar CIP codes, these are primarily traditional computer science or information systems degrees housed in colleges of engineering and business. The most comparable program is the University of Tennessee, Knoxville's BS in Data Science through their College of Emerging and Collaborative Studies, recently implemented in fall 2024. However, TTU's program distinguishes itself through its structured cognate area approach that incorporates a sequence of courses equivalent to a minor and emphasizes industry partnerships that provide students with contextualized learning experiences in their chosen fields.

WORKFORCE ALIGNMENT

The proposed BS in Interdisciplinary Computing addresses critical workforce needs across multiple sectors in Tennessee's rapidly evolving technology landscape. Employment data from O*NET Online in April 2024 demonstrates substantial and growing demand for computing professionals, with recent job searches revealing 560 Computer and Information Systems Manager positions, 559 Computer Systems Analyst positions, and 1,216 Software Developer positions posted in Tennessee during a two-month period. Additionally, a June 2024 search on Indeed identified 363 open Computer Information Systems positions in Tennessee requiring a bachelor's degree. This demand is further amplified by Oracle's April 2024 announcement of relocating their corporate headquarters to Nashville, which is expected to create 8,500 jobs over the next decade, many requiring computing expertise combined with domain-specific knowledge. In addition, Tennessee's Academic Supply for Occupational Demand Report has identified information technology (IT) as a high-demand occupation in Tennessee, with IT occupations projected to grow 2.9% annually from 2020 to 2030,

significantly outpacing average occupational growth. The report specifically highlights unmet needs for bachelor's degree holders in computer systems analysis and computer and information sciences, which are areas directly addressed by the proposed program's interdisciplinary approach. This local demand reflects broader national trends documented by the U.S. Department of Labor, which projects computer and information technology occupations to grow much faster than average through 2032, with approximately 377,500 annual openings nationally. The program's graduates will be particularly well-positioned for these opportunities given their unique combination of computing and discipline-focused expertise.

Tennessee's state government has further emphasized the importance of computing education through recent legislative initiatives, including House Bill 2153 (passed in 2022), which requires high school students to receive at least one credit of computer science education for high school graduation beginning with the 2024-25 ninth-grade cohort. This legislative priority underscores the state's commitment to developing a technology-capable workforce and creates a pipeline of future students with computer science foundations who may seek higher education in this field. With its innovative integration of computing with various disciplinary domains, the proposed program directly supports these state workforce development initiatives while addressing the documented gap between traditional computer science programs and the cross-disciplinary computing expertise increasingly required across Tennessee's evolving economy.

CURRICULUM

The proposed BS in Interdisciplinary Computing would require 120 credit hours spread across five primary areas that combine computing expertise with disciplinary depth in a non-computing field. The primary components include a General Education Core (41 credit hours), a Computing Core (30 credit hours), an Intersectional Core (18 credit hours), a Cognate Area (25 credit hours), and Electives (six credit hours). The Computing Core will emphasize fundamentals in algorithmic thinking, software development, data science, and user experience design, while the Intersectional Core will focus on critical thinking, design thinking, ethics, and entrepreneurship. The Cognate Area will provide depth equivalent to a minor in a specific discipline. Another notable feature of the Cognate Area is the inclusion of 10 credit hours of formal experiential learning through a studio sequence where students actively engage in developing software solutions relevant to their chosen area. The curriculum also includes six credit hours of electives, enabling students to transfer in courses from other institutions or apply credits to complete a minor if desired. There will be 11 new courses designed to equip students with both technical computing skills and contextual knowledge needed to apply technology solutions within specific domains.

The program facilitates interdisciplinary integration through its innovative cognate area structure, which provides students with depth in one of fourteen non-computing disciplines, including areas such as biology, business, nursing, journalism, criminal justice, environmental studies, and education. The program will align its learning outcomes with the Accreditation Board for Engineering and Technology (ABET) Computing Accreditation Commission's general criteria as benchmarks for quality. The program will also identify faculty "Cognate Champions" from each discipline who serve as advocates and subject matter experts, helping to design appropriate course sequences, develop relevant studio projects, and forge industry connections specific to their field. These champions will collaborate with computing faculty to ensure that students develop both disciplinary knowledge and the ability to apply computing solutions within their chosen context.

PROJECTED ENROLLMENT AND GRADUATION

The enrollment and graduation figures below represent full-time and part-time enrollment.

	2025-26	2026-27	2027-28	2028-29	2029-30
Enrollment	10	15	20	30	40
Graduates	0	0	0	7	12

STUDENT INTEREST AND COMMUNITY PARTNERSHIPS

A survey was distributed to current TTU students in 2023 to assess interest in the proposed BS in Interdisciplinary Computing. The survey, which received responses from 45 students (18% response rate) out of 248 contacted, demonstrated strong support for the new degree offering. Survey data show that 94% of respondents (n=42) indicated that TTU should offer this degree, while 72% of respondents (n=32) found the program aligned with their career goals. Additionally, 59% (n=27) stated they would have considered it as a major had it been available when they started at the university. The survey also provided opportunities for open-ended responses. In these qualitative comments, students highlighted the value of integrating computing with other disciplines, particularly noting how such preparation would benefit careers where understanding domain-specific knowledge and computing applications is increasingly vital. Several respondents specifically mentioned that the program would address gaps in their educational experience, with some noting they had switched from computer science to other programs due to challenges with traditional computer science requirements.

Letters of support from regional employers and organizations highlight the industry demand for graduates with interdisciplinary computing expertise. Support letters were provided by Cookeville Regional Medical Center, Oak Ridge National Laboratory, Science Applications International Corporation, and the Highlands Economic Partnership. These industry partners expressed interest in offering internship opportunities for students completing the studio course requirements during the program. They also emphasized that the program would prepare students for growing job markets by creating clear pathways into computer science while broadening graduates' ability to serve across various industries, including healthcare, research, engineering, and technology.

EXTERNAL JUDGMENT

An external review of the proposed program was conducted on December 3, 2024, by Dr. Glenn Platt, C. Michael Armstrong Chair/Professor and Director of the Armstrong Institute for Emerging Technology at Miami University. Dr. Platt conducted a comprehensive site visit that included meetings with university leadership, faculty, students, and industry partners. In his evaluation, Dr. Platt offered "whole-hearted and enthusiastic support for the proposal," describing the Interdisciplinary Computing program as "the type of program every university should offer" that "represents a forward-thinking administration and faculty who understand the future of education in a world led by AI and code literacy." He highlighted the program's distinctive strength in blending computing expertise with domain-specific knowledge, noting that "the strongly developed blend of computer science and cognate area culminating in their senior project has the potential to paint a picture of a computing degree that is unlike many others." Based on his conversations with industry partners, he confirmed "there is a clear market for students with this background," and concluded that if "properly marketed, it's hard to imagine this program not succeeding."

PROGRAM COSTS AND REVENUES

The proposed expenditures for the BS in Interdisciplinary Computing are listed in Table 1 below. Start-up costs are minimal, and most expenditures are for consultants, IT, and marketing. The program will be administered by the School of Interdisciplinary Studies (SOIS) housed in the College of Interdisciplinary Studies (CIS), while the computing core will be taught by the Department of Computer Science in the College of Engineering. A 12-month lecturer/coordinator will be hired in the SOIS to collaborate with the department chairs in computer science within the first year, along with five adjunct instructors. A recruitment specialist will also be hired in the CIS who will devote 50% of their time to assist with recruitment, advising, course scheduling, and other administrative responsibilities. Additionally, an Administrative Associate will be hired in the SOIS to support this program in the form of student information reports, ordering supplies, program communication, and maintaining financial records. The remaining recurring expenditures will go toward accreditation, library, marketing, and travel costs.

Table 1: Estimated Costs to Deliver the Proposed Program

<i>Estimated Costs to Deliver the Proposed Program</i>						
One-Time Expenditures						
Category	Planning	Year 1	Year 2	Year 3	Year 4	Year 5
Faculty & Instructional Staff						
Non-Instructional Staff						
Graduate Assistants						
Accreditation						
Consultants	\$2,500					
Equipment						
Information Tech		\$2,500	\$2,500			
Library						
Marketing	\$1,000					
Facilities						
Travel						
Other						
<i>Total One-Time Expenditures</i>	<i>\$3,500</i>	<i>\$2,500</i>	<i>\$2,500</i>	<i>\$0</i>	<i>\$0</i>	<i>\$0</i>
Recurring Expenditures						
Category	Planning	Year 1	Year 2	Year 3	Year 4	Year 5
Faculty & Instructional Staff		\$190,850	\$194,326	\$202,906	\$206,593	\$213,598

Non-Instructional Staff		\$40,000	\$41,200	\$42,436	\$43,708	\$45,020
Graduate Assistants						
Accreditation						\$2,500
Consultants						
Equipment						
Information Tech						
Library		\$4,000	\$4,000	\$4,000	\$4,000	\$4,000
Marketing		\$2,000	\$3,000	\$4,000	\$5,000	\$6,000
Facilities						
Travel		\$2,000	\$2,500	\$2,500	\$2,500	\$3,000
Other						
<i>Total Recurring Expenditures</i>	\$0	\$238,850	\$245,026	\$255,842	\$261,801	\$274,118
Grand Total (One-Time and Recurring)	\$3,500	\$241,350	\$247,526	\$255,842	\$261,801	\$274,118
Projected Revenues						
Category	Planning	Year 1	Year 2	Year 3	Year 4	Year 5
Tuition		\$113,760	\$175,759	\$241,376	\$372,925	\$512,151
Grants						
Other						
Total Revenues	\$0	\$113,760	\$175,759	\$241,376	\$372,925	\$512,151