



## TENNESSEE HIGHER EDUCATION COMMISSION

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**REGULAR CALENDAR ITEM:** II.G.

**MEETING DATE:** May 16, 2024

**SUBJECT:** New Academic Program  
University of Tennessee, Knoxville  
Innovative Transdisciplinary Studies, Bachelor of Science (BSITS)  
CIP Code: 30.0601 (Systems Science and Theory)

**ITEM TYPE:** Action

**ACTION RECOMMENDATION:** Approval

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### **PROGRAM DESCRIPTION**

The University of Tennessee, Knoxville (UTK) proposes a 120-credit hour, Bachelor of Science (BSITS) in Innovative Transdisciplinary Studies. The proposed program is designed to be a customizable degree to prepare students for future employment opportunities and emerging workforce demands that require interdisciplinarity. The program curriculum is designed to cater to student interests across disciplines and incorporates several 12-credit, stackable certificates including cybersecurity, applied artificial intelligence, and data science.

The proposed program will have a hybrid delivery method and will include hands-on experience for all students via 6-12 credit hours in research, service, and internships. These courses are designed to strengthen skills and employability and will be taught in partnership between faculty in the College of Emerging and Collaborative Studies (CECS) and the UTK Center for Career Development. The proposed program is designed to accommodate transfer students interested in pursuing a four-year degree in an emerging field, students interested in a specific interdisciplinary career path, and students who are uncertain about their ideal career and want to explore options. Further, the customizable curriculum allows for timely adaptation to workforce demands and students' interests.

### **INSTITUTIONAL GOVERNING BOARD APPROVAL**

The proposed Innovative Transdisciplinary Studies, BSITS program was approved by the University of Tennessee Board of Trustees on February 29 – March 1, 2024.

### **PROPOSED IMPLEMENTATION DATE**

August 1, 2024

### **ALIGNMENT WITH STATE MASTER PLAN AND INSTITUTIONAL MISSION/STRATEGIC PLAN**

The proposed Innovative Transdisciplinary Studies, BSITS aligns with the Drive to 55 and THEC's State Master Plan for Higher Education by enabling students from diverse backgrounds to customize their own bachelor's degree, and specifically furthers this goal by providing a pathway to a bachelor's degree for Tennessee Transfer Pathway (TTP) students.

The proposed program aligns with UTK's mission, which states: "we are a diverse community with a shared commitment to discovery, creativity, learning, and engagement. At UT Knoxville, we: empower learners of all ages and backgrounds to achieve their dreams through accessible and affordable

education and state-of-the-art research training opportunities. Advance the prosperity, well-being, and vitality of communities across Tennessee and around the world through our research, teaching, service, and engagement. Commit to excellence, equity, and inclusion within the university, across the state, and in all our global activities.” More specifically, the proposed program will allow students to “advance the prosperity, well-being, and vitality of communities across Tennessee” through internship placements, research courses, and capstone projects that affect their communities. Finally, the program also aligns with UTK’s mission to “empower learners of all ages and backgrounds” by offering an innovative and customizable curriculum designed to capture a significant portion of TTP students annually. CECS is actively engaged in discussions with community colleges, such as Roane State Community College, to work out TTP arrangements.

## **CURRICULUM**

The proposed program will consist of 120 credit hours of coursework and will be offered with both on-ground and online course options. The coursework will include 50-58 credit hours of general education requirements; 27 credit hours of core courses; 6-12 credit hours in research, service, and internships; and 21-37 credit hours earned in stackable 12-credit-hour certificates and minors. An internship will be required for all students, and all internships will be developed in partnership with industry.

CECS plans to launch ten certificates in fall 2024, with offerings in cybersecurity, data science, applied artificial intelligence, human-computer interaction, emerging design studies, user experience and game design, law tech, connected world, one health, and sustainability. Each certificate will include a Gateway 101 course, plus three (3) additional three-credit hour disciplinary courses. The gateway courses will introduce key concepts to students to ensure success in more advanced coursework. Fourteen new courses will be developed, including nine (9) core courses and five (5) courses for the applied artificial intelligence certificate. These certificates will be built into the curriculum of the proposed program and will allow students to build skill sets in their areas of interest across disciplinary bounds.

At the completion of the Innovative Transdisciplinary Studies, BSITS program, students will be able to:

- Demonstrate a deep understanding of concepts, theories, and methods from multiple disciplines relevant to the chosen transdisciplinary field of study.
- Identify connections, patterns, and interdependencies between different disciplines and integrate this knowledge to address complex problems.
- Apply systems thinking principles to comprehend the complexity and interconnectedness of social, environmental, and technological systems.
- Consider the societal and environmental implications of transdisciplinary solutions and propose responsible courses of action.
- Plan and conduct transdisciplinary research projects, employing appropriate methodologies from different disciplines.
- Synthesize and interpret data from diverse sources to support evidence-based conclusions.
- Design and execute a comprehensive transdisciplinary project that integrates insights from different disciplines to address a complex issue.
- Collaborate effectively with individuals from different disciplines to collectively address transdisciplinary problems.
- Communicate ideas and findings clearly and coherently to diverse audiences, including those without specialized knowledge in particular disciplines.

## PROGRAM PRODUCTIVITY

Projections for the Innovative Transdisciplinary Studies, BSITS program estimate ten (10) students will enroll in the first year, with total enrollment of 40 by year five. The program will graduate its first students in year four.

	2024-25	2025-6	2026-27	2027-28	2028-29
<b>Enrollment</b>	10	15	20	30	40
<b>Graduates</b>	--	0	0	7	11

## PROGRAM DUPLICATION

No other programs are offered at Tennessee institutions with the innovative transdisciplinary focus of the proposed program.

Comparable programs are offered with an interdisciplinary approach at the following public institutions: East Tennessee State University, Interdisciplinary Studies (BS and BAS); Middle Tennessee State University, Integrated Studies (BS); Tennessee State University, Arts and Sciences (BS); Tennessee Technological University, Interdisciplinary Studies (BS); University of Tennessee, Martin, Interdisciplinary Studies (BS); University of Memphis, Bachelor of Liberal Studies and Bachelor of Professional Studies.

The proposed program is distinctive from the existing Bachelor of Arts in Interdisciplinary Studies at UTK because of the transdisciplinary focus as opposed to traditional discipline-specific courses, the stackable credentials, internships, and industry partnerships. The existing interdisciplinary programs do not have a coherent theme but are a selection of courses that can count towards degree completion. In contrast, the ITS program will utilize faculty expertise to develop courses collaboratively in in-demand and emerging areas of study.

## STUDENT DEMAND

A survey of current undergraduate students in the Tickle College of Engineering and the College of Information Sciences was conducted in 2023 and resulted in 281 responses. 34 percent (N=96) indicated that they would have been interested in a major with opportunities for multidisciplinary education had it been available. Respondents indicated the most interest in Artificial Intelligence (N=99) and Game Design (N=97) as potential areas for study but selected Artificial Intelligence (N=73) and Data Science (N=62) as the certificates they would be most likely to choose.

## OPPORTUNITIES FOR PROGRAM GRADUATES

Lightcast, a labor market analytics firm, conducted a study of local and regional demand. Many of the target occupations for graduates, including software developers, computer systems analysts, computer and information systems managers, network and computer systems administrators and engineers are projected to increase by 14 percent from 2022-2027. Because of the transdisciplinary nature of the program, UTK also conducted opportunity analysis in several areas, including the foci of certificates developed for the proposed program. For example, Artificial Intelligence, Game Design, and Human/User-Centered Design are all anticipated to experience double-digit growth in coming years. From July 2022 to June 2023, there were 307,329 unique job postings in fields related to the proposed program, such as software engineers, systems engineers, java developers, software developers, DevOps engineers, system administrators, IT project managers, and scrum masters.

No programs in the entire Southeast region graduate students in the category of the proposed program, making UTK well poised to provide a unique, adaptable degree program to serve the needs of industry.

Future certificate development will occur in partnership with industry as well, meaning that the proposed program will continue to offer skills that are valued and sought out in industry.

Letters of industry support were received from multiple organizations including Moment Energy, JPMorgan Chase, Viridi Parente, IonQ, iO Urology, and Carbon Rivers. Additional letters of support from higher education institutions and systems in Tennessee include the Tennessee Board of Regents, Roane State Community College as well as the Tickle College of Engineering and Herbert College of Agriculture at the University of Tennessee, Knoxville.

### **INSTITUTIONAL CAPACITY TO DELIVER THE PROGRAM**

Nineteen existing faculty are anticipated to contribute to the proposed program. These faculty are at various ranks and come from a number of colleges and departments at UTK, which is reflective of the interdisciplinary nature of the program. A program director has been hired and began in July 2023. Faculty Fellows (from existing UTK faculty) will be strategically recruited from across campus to co-develop and co-teach the collaborative core courses starting in August 2026. Industry partners may also play a role in teaching. One (1) full-time lecturer has already been hired to support the program, and an additional five (5) will be hired to start in August 2024. Additionally, the program will have a coordinator, director of marketing and communications, director of advising, director of business operations, and director of partnerships, all housed in CECS. An internship coordinator will begin in year three and will split their time between the three (3) proposed CECS programs.

Existing space in the Claxton Education Building will be used for the proposed program. The building is well suited for interdisciplinary instruction and experiential and group learning, and includes lounge space, multi-purpose seminar rooms, as well as an Applied Living and Learning Lab. Drop-in advising and specialized support for internships will be available for students of the proposed program. Claxton is currently being renovated to provide offices for support staff of the proposed program, in addition to renovations underway for the other two (2) proposed CECS programs. Other campus-based resources include the AI Tennessee Initiative, the Writing Center, the Stat Lab, the Math Place, and a number of supports in place for all UTK undergraduates.

### **EXTERNAL JUDGEMENT**

An external review of the proposed program was conducted during a site visit on December 5, 2023, by Dr. Bruce Kingma, Professor of Entrepreneurship and Director of Undergraduate Programs in the School of Information Systems at Syracuse University. The site visit included meetings with campus administrators and faculty from UTK, as well as current UTK students and industry partners.

Dr. Kingma recommended approval of the proposed program, noting that it is a “great idea to start a college that is nimble and can create new courses, certificates, and programs in response to trends in market demand for graduates.” He added that the curriculum is “sufficiently extensive and sophisticated,” and that the “certificate areas of study are in high demand by employers.”

### **ASSESSMENT AND POST-APPROVAL MONITORING**

An annual performance review of the proposed program will be conducted for the first five (5) years following program approval. The review will be based on benchmarks established in the approved proposal. At the end of this period, the campus, institutional governing board, and THEC staff will perform a summative evaluation. If benchmarks are not met during the monitoring period, the Commission may recommend that the institutional governing board terminate the program.

## PROGRAM COSTS AND REVENUE

The proposed one-time and recurring expenditures for the Innovative Transdisciplinary Studies, BSITS program are listed in Table 1. Projected revenue is displayed in Table 2.

**Table 1: Estimated Costs to Deliver the Proposed Program**

<b>Estimated Costs to Deliver the Proposed Program</b>						
<b>One-Time Expenditures</b>						
<b>Category</b>	<b>Planning</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>
Faculty & Instructional Staff (Faculty Lead)						
Accreditation						
Consultants	\$2,000					
Equipment						
Information Tech						
Library						
Marketing						
Facilities	\$62,006					
Travel						
Other						
<i>Total One-Time Expenditures</i>	<i>\$64,006</i>	<i>\$0</i>	<i>\$0</i>	<i>\$0</i>	<i>\$0</i>	<i>\$0</i>
<b>Recurring Expenditures</b>						
<b>Category</b>	<b>Planning</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>
Faculty & Instructional Staff*	\$105,600	\$165,200	\$188,168	\$215,981	\$278,742	\$282,204
Non-instructional Staff**		\$39,866	\$44,166	\$61,699	\$72,466	\$83,268
Graduate Assistants						
Accreditation						
Consultants						
Equipment						
Information Tech						
Library						
Marketing		\$2,000	\$2,000	\$2,000	\$1,000	\$1,000
Facilities						
Travel						
Other						
<i>Total Recurring Expenditures</i>	<i>\$105,600</i>	<i>\$207,066</i>	<i>\$234,334</i>	<i>\$279,680</i>	<i>\$352,208</i>	<i>\$366,472</i>
<b>Grand Total (One-Time and Recurring)</b>	<b>\$169,606</b>	<b>\$207,066</b>	<b>\$234,334</b>	<b>\$279,680</b>	<b>\$352,208</b>	<b>\$366,472</b>

\* This includes the Program Director (all years), Faculty Fellows (years 1 and 2), and lecturers (years 1-5).

\*\* This includes student graders, program coordinator, and internship coordinator (beginning in Year 3).

**Table 2: Projected Revenue**

Projected Revenue						
Category	Planning	Year 1	Year 2	Year 3	Year 4	Year 5
Tuition		\$27,252	\$65,405	\$122,634	\$218,016	\$314,761
Grants						
Other						
<b>Total Revenues</b>	<b>\$0</b>	<b>\$27,252</b>	<b>\$65,405</b>	<b>\$122,634</b>	<b>\$218,016</b>	<b>\$314,761</b>