



# TENNESSEE HIGHER EDUCATION COMMISSION

REGULAR CALENDAR ITEM: I.B.

**MEETING DATE:** May 15, 2025

**SUBJECT:** New Academic Program  
Tennessee Technological University  
Agriscience Technology, Master of Science (MS)

**ITEM TYPE:** Action

## PROGRAM OVERVIEW

<b>Title and Designation</b>	Agriscience Technology, Master of Science (MS)
<b>Concentrations</b>	None
<b>Accreditation</b>	No programmatic accreditation applicable.
<b>CIP Code and Description</b>	<b>01.0308 (Agroecology and Sustainable Agriculture)</b> A program that focuses on agricultural principles and practices that, over the long term, enhance environmental quality, make efficient use of nonrenewable resources, integrate natural biological cycles and controls, and are economically viable and socially responsible; and that may prepare individuals to apply this knowledge to the solution of agricultural and environmental problems. Includes instruction in principles of agroecology, crop and soil sciences, entomology, horticulture, animal science, weed science and management, soil fertility and nutrient cycling, applied ecology, agricultural economics, and rangeland ecology and watershed management.
<b>SOC Code and Title</b>	11-9013 (Farmers, Ranchers, and Other Agricultural Managers) 19-1013 (Soil and Plant Scientists) 19-1031 (Conservation Scientists) 25-1041 (Agricultural Sciences Teachers, Postsecondary) 25-1043 (Forestry and Conservation Science Teachers, Postsecondary) 45-1011 (First-Line Supervisors of Farming, Fishing, and Forestry Workers)
<b>Credit Hours</b>	30-33
<b>Implementation Date</b>	August 1, 2025
<b>Modality and Delivery Site</b>	On-Ground/Traditional
<b>Department/College</b>	School of Agriculture, College of Agriculture and Human Ecology
<b>Governing Board Approval Date</b>	March 6, 2025

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

The proposed Master of Science (MS) in Agriscience Technology at Tennessee Technological University (TTU) was developed in response to increasing industry and student demand for a

program focused on technological practices related to sustainable agriculture and environmental systems. The Agriscience Technology, MS will serve both current undergraduates and working professionals and will develop graduates who are ready to solve real-world problems through research, adopting new technologies, and improving production practices. The program leverages the university's extensive resources, including 340 acres of campus farmland and a 1,200 acre farm in Livingston, to promote "Education for Life" and "Innovation" through advanced research in global positioning systems, plant genetics, engineering, and soil conservation.

The proposed program aligns with THEC State Master Plan for Higher Education's call for academic programming that addresses Tennessee's economic development and workforce needs through emerging technologies. This alignment is evidenced by the robust partnerships with industry leaders like Cobb-Vantress, Aviagen, Tyson, DeltAg, and John Deere, as well as \$2 million dollars of existing grant-funded research initiatives in poultry science that will benefit students of the proposed program. The proposed Agriscience Technology, MS also aligns with the Family Prosperity and Future of Work pillars of the Master Plan 2020 Update by offering a program that will improve the lives of all Tennesseans through agricultural research designed to address issues of environmental impact, production efficiency, and long-term sustainability.

Building on TTU's century-long agricultural legacy, the proposed MS in Agriscience Technology addresses two core goals of the "Tech Tomorrow" strategic plan: "Education for Life" and "Innovation in All We Do." The proposed program will promote "Education for Life" by offering courses, experiences, and opportunities designed to develop students' career advancement. The proposed Agriscience Technology, MS also furthers the "Innovation in All We Do" goal by offering a distinctive, technology-focused program to provide practical solutions to problems through innovation. The proposed program also aligns with the university's Rural Reimagined initiative by training skilled graduates to help rural communities transition to smart farming systems, while fostering cross-disciplinary research collaboration that responds to consistent alumni demand for graduate-level agricultural education.

## **PROGRAM DUPLICATION**

TTU's proposed MS in Agriscience Technology would be the only program focusing solely on technology practices related to sustainable agriculture. It also stands apart by integrating traditionally separate disciplines like animal science, plant science, and soil science into a unified study of agricultural systems ecology, training graduates to use cutting-edge technologies like drones and DNA sequencing to enhance agricultural productivity while minimizing environmental impacts in smart farming systems.

## **WORKFORCE ALIGNMENT**

The proposed MS in Agriscience Technology at TTU addresses critical workforce development needs in the state's agricultural sector, which generates an \$81 billion economic impact and sustains 342,000 jobs across 69,500 farming operations occupying 40% of Tennessee's acreage. The Coalition for a Sustainable Agriculture Workforce emphasizes an urgent demand for highly trained agronomists, soil scientists, and plant breeders to advance technical innovations essential for meeting future production and sustainability challenges. This graduate program plans to respond to this urgent demand and the U.S. Department of Labor's projected 7% growth in Agricultural and Food Scientist positions through 2026, by training advanced professionals equipped to facilitate Tennessee's transition from conventional to smart farming systems while addressing emerging demands in sustainable crop production, food security, and environmental resource preservation.

TTU is also well positioned between Knoxville, Nashville, and Chattanooga to serve the 14 county Upper Cumberland Region, where agriculture contributes \$1.7 billion and sustains more than 8,800 jobs across eight counties. Despite the regional presence of five community colleges, three Tennessee Colleges of Applied Technology, and TTU, a significant deficit persists in advanced STEM-trained agricultural professionals. The program will address this workforce gap by preparing graduates to implement innovative technologies and sustainable practices across one of the most geographically diverse regions in the southeastern United States.

## CURRICULUM

The proposed MS in Agriscience Technology will have a thesis and non-thesis option. Students in the thesis option must take 30 credit hours, while those in the non-thesis option will complete 33 credit hours. In each option, 12-18 credit hours will be selected by the student's graduate advisory committee based on their intended research topic or the topic of their special project for non-thesis students. The program modality is majority on-ground (hybrid) and designed to be completed in two years. The program will require eight new courses, all of which have been developed and undergone necessary campus approvals.

The MS in Agriscience Technology program aims to develop flexible, innovative graduates who can solve real-world problems using the latest technological advances. Graduates must be adept at applying integrative analytical skills, incorporating technology into their research programs, and being capable of working in diverse groups. This will be achieved through a multidisciplinary approach within the School of Agriculture, utilizing faculty with expertise in animal science, horticulture, soil science, geospatial technology, engineering, and agribusiness.

Students will benefit from research opportunities alongside TTU faculty, many of whom have won sizeable prestigious grants and research funding from government and industry sources. TTU is also constructing and renovating state of the art facilities to support the proposed program, including a new Agriscience Technology Innovation Center (with donor funds and university match) and a greenhouse facility headhouse (renovation via grant funding). These new and renovated facilities will complement the existing poultry research facility, lab space in Oakley Hall, and shared lab facilities in the Science Building and Water Center.

## 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
<b>Enrollment</b>	7	12	16	19	19
<b>Graduates</b>	0	3	4	7	7

## STUDENT INTEREST AND COMMUNITY PARTNERSHIPS

In 2018, TTU surveyed alumni and students currently enrolled in the School of Agriculture to determine their interest in the proposed program. TTU distributed the survey to 680 alumni and received 128 responses resulting in an 18.2% response rate. Among surveyed TTU alumni, 30% (n=38) expressed high interest in the program, with 22% (n=28) ready to enroll immediately, while 85% (n=109) preferred part-time attendance and 53% (n=68) indicated potential employer support, including 11% (n=14) whose employers require or encourage sustainable agriculture degrees. Of the 320 undergraduate students surveyed, 75 responded (23.44% response rate), with 21% (n=16)

expressing high interest and 65% (n=49) indicating moderate interest in the program. Most undergraduate respondents plan to enroll within two to four years of the program's launch, with 63% (n=47) intending to attend full-time.

Letters of support were received from industry partners who spoke to the need to develop and implement new technologies and research to boost farm production and efficiencies. The industry partners also expressed an interest in hiring graduates from this program who will be adept in the technological changes and can offer solutions for a more sustainable future. Support letters were provided by the Deputy Commissioner of the Tennessee Department of Agriculture, the Tennessee Farmers' Cooperative, the Tennessee Poultry Association, and Generation Farms.

## EXTERNAL JUDGMENT

An external review of the proposed program was conducted on September 12 and 13, 2024, by Dr. Dean Kopsell, Associate Dean for Academic and Faculty Affairs at the University of Georgia. The site visit included tours of TTU's farms and laboratory facilities, meetings with university leadership, faculty, and students, as well as industry and community partners. Dr. Kopsell stated that he strongly endorsed the program, noting he was "unaware of any other program within the state or region that provides such a curriculum." He believes the program has been "uniquely crafted to provide solid training in the emerging field of agriscience technologies." He emphasized the program's strong alignment with workforce needs, citing the National Institute of Food and Agriculture of the U.S. Department of Agriculture's report "Employment Opportunities for College Graduates in Food, Agriculture, Renewable Natural Resources and the Environment, United States, 2020-2025," which projects that "employment opportunities will remain strong for new college graduates with interest and expertise in food, agriculture, renewable natural resources and the environment, with an average of 59,400 job openings annually in the agricultural sector." Dr. Kopsell concluded his report by outlining the program's comprehensive benefits, noting its potential to enhance faculty development and retention while expanding research capacity and grant funding, drive economic development in the agricultural sector, meet regional workforce demands, and create unique educational opportunities for both traditional students and working professionals.

## PROGRAM COSTS AND REVENUES

The proposed expenditures for the MS in Agriscience Technology are listed in Table 1 below. Start-up costs are minimal, and most expenditures are for information technology, marketing, and travel for faculty professional development. The proposed program utilized the expedited academic program approval process, so tuition and revenue figures were not provided as delineated in the policy. Facility renovation and construction will be covered by donor funds, university matching funds, and grants; therefore, facilities costs are not included below.

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

<i><b>Estimated Costs to Deliver the Proposed Program</b></i>						
<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						

Non-Instructional Staff						
Graduate Assistants						
Accreditation						
Consultants	\$3,000					
Equipment						
Information Tech						
Library						
Marketing						
Facilities						
Travel						
Other						
<i>Total One-Time Expenditures</i>	\$3,000	\$0	\$0	\$0	\$0	\$0
<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						
Non-Instructional Staff						
Graduate Assistants						
Accreditation						
Consultants						
Equipment						
Information Tech		\$3,250	\$3,250	\$3,250	\$3,250	\$3,250
Library						
Marketing	\$2,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
Facilities						
Travel	\$4,000	\$4,000	\$4,000	\$4,000	\$4,000	\$4,000
Other						
<i>Total Recurring Expenditures</i>	\$6,000	\$8,250	\$8,250	\$8,250	\$8,250	\$8,250
<b>Grand Total (One-Time and Recurring)</b>	<b>\$9,000</b>	<b>\$8,250</b>	<b>\$8,250</b>	<b>\$8,250</b>	<b>\$8,250</b>	<b>\$8,250</b>

Projected Revenues						
Category	Planning	Year 1	Year 2	Year 3	Year 4	Year 5
Tuition		\$62,568	\$108,072	\$136,512	\$159,264	\$159,264
Grants						
Other						
<b>Total Revenues</b>	<b>\$0</b>	<b>\$62,568</b>	<b>\$108,072</b>	<b>\$136,512</b>	<b>\$159,264</b>	<b>\$159,264</b>